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The Admiral, the Virgin, and the Spectrometer: Observations on the Coëtivy Hours (Dublin, Chester Beatty Library, MS W082)

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Abstract

This article examines the nature and implications of the extensive Marian texts and imagery in the mid-fifteenth-century Parisian Coëtivy Hours (Dublin, Chester Beatty Library, MS W082), and reports the findings from scientific investigation of the inks and pigments that were used in the book.

Securely datable to between 1442 and 1450, the Coëtivy Hours was made for Prigent VII de Coëtivy (d. 1450), governor of La Rochelle, royal chamberlain, lieutenant, and ultimately (from 1439) admiral of France.¹ In terms of content, it is a compendious

example of the genre: in addition to the core elements of calendar, Gospel readings, Hours of the Virgin (with intercalated Hours of the Cross and the Holy Spirit), penitential psalms, litany, Office of the Dead, and suffrages, it contains numerous supplementary prayers and other texts (notably two debates between Life and Death and a lengthy exposition of the Seven Articles of Faith).² As all of these texts are accompanied by illustrations, the manuscript boasts a long suite of 148 miniatures. To put the scale of this cycle in context, it suffices to note that the large and luxurious book of hours that was made about a decade later for Philip the Good, Duke of Burgundy, a patron of the highest order, features twenty fewer illustrations.³

We are most grateful to the Chester Beatty Library and its staff, above all Jill Unkel, for making the special arrangements that permitted the scientific analysis of this and other manuscripts, and for their kind hospitality more generally. We thank Rob and Felicity Shepherd for their ongoing sponsorship of our work, which underwrote the trip to Dublin. Funding from the Arts & Humanities Research Council supported the examination of certain other manuscripts cited as comparanda. The illustrations are reproduced by kind permission of the Trustees of the Chester Beatty Library.

1. Dublin, Chester Beatty Library, MS W082 (Use of Paris). The *terminus post quem* is established by the original heraldry (which rules out any time before Prigent's betrothal to Marie de Rais), the *terminus ante quem* by the death of the patron himself. Favoring ca. 1444 in particular is the fact that in that year Prigent paid for a box and a leather pouch specifically for *horae* ("Item pour une boeste et une bourse de cuir pour les heures-xv s t[ournois]": record printed in full in Louis de la Trémoille, *Prigent de Coëtivy, amiral et bibliophile* (Paris: Honoré Champion, 1906), 55–57; however, as MS W082 was only one of at least three books of hours that he is known to have possessed, we cannot be absolutely sure that this relates to our manuscript (another of Prigent's *horae* survives as Rennes, Bibliothèque de la métropole, MS 1511; dating from the end of the fourteenth or beginning of the fifteenth century, that book cannot have been commissioned by Prigent himself). For further discussion on Prigent de Coëtivy and his book-collecting activities in general, see Trémoille, *Prigent* (with editions of relevant primary sources); Roseline Harrouët, "Une famille de bibliophiles au XV^e siècle: les Coëtivy," *Bulletin et Mémoires de la Société Archéologique du Département d'Ille-et-Vilaine* 102 (1999): 139–99; and Diane E. Booton, *Manuscripts, Market and the Transition to Print in Late Medieval Brittany* (Farnham: Ashgate, 2010), 169–76 and 338–43.

2. The textual content is itemized in M. R. James et al., *A Descriptive Catalogue of the Second Series of Fifty Manuscripts (nos. 51 to 100) in the Library of Henry Yates Thompson* (Cambridge: CUP, 1902), 238–64, no. 85. The collation given there (with only three leaves reported to be lacking) is crucial evidence for the state of the book prior to its partial dismemberment by the Beattys (see note 11 below).

3. The Hague, Koninklijke Bibliotheek, MS 76F2: Anne Margaret W. As-Vijvers and Anne S. Korteweg, eds., *Splendour of the Burgundian Netherlands: Southern Netherlandish Illuminated Manuscripts in Dutch Collections* (Zwolle: WBooks, 2018), no. 32. Its original 126 miniatures were augmented at the end of the fifteenth or beginning of the sixteenth century by an additional thirty-nine as part of an extensive refashioning: see Anne S. Korteweg, "The Book of Hours of Philip the Good, Duke of Burgundy, in the Hague and Its Later Adaptation," in "Als ich can." *Liber Amicorum in Memory of Professor Dr. Maurits Smeyers*, ed. Bert Cardon, Jan van der Stock, and Dominique Vanwijnsberghe, *Corpus van verluchte handschriften* 11–12 (Leuven: Peeters, 2002), 757–71.

The decoration of the Coëtivy Hours is associated with the atelier of the Dunois Master. Emerging from the circle of the Bedford Master to become the leading continuator of his repertoire during the middle third of the fifteenth century, this Parisian illuminator is plausibly, albeit inconclusively, identified on circumstantial grounds with Jean Hancelin, a documented manuscript painter whom Prigent de Coëtivy is known to have favored;⁴ a further speculation would see him as the son of Haincelin de Haguenau, who is widely thought to have been the Bedford Master.⁵ Be that as it may, it is abundantly clear that the oeuvres that have been assembled around the names of the Dunois and Bedford Masters are the products not of two individuals but rather of extended ateliers—or even of more loosely affiliated collectives of book professionals whose changing patterns of collaboration were determined by the needs and opportunities of the moment. Equally clear is that both operations enjoyed the patronage of the highest echelons of contemporary society. In the case of the Dunois Master (a sobriquet used here to embrace all miniatures in this general style, not merely those that are arguably autograph work of the atelier's principal practitioner),⁶ this included leading members of the circle

4. In 1444 Prigent made a payment to “Jean Hancelin enlumineur” for “iij romans: c'est assavoir *Lancelot*, *Tristan* and *Gyron le courtois*”: record printed in full in Trémoille, *Prigent*, 55, the sum expended noted in a separate entry (56).

5. See Inès Villela-Petit, *Le Bréviaire de Châteauroux* (Paris: Somogny, 2003), 39–46; Eberhard König, *The Bedford Hours: The Making of a Medieval Masterpiece* (London: British Library, 2007), 34–37; Mara Hofmann, “Haincelin de Haguenau et l'acanthé à Paris,” in *Quand la peinture était dans les livres. Mélanges en l'honneur de François Avril*, ed. Mara Hofmann, Eberhard König, and Caroline Zöhl, *Ars Nova: Studies in Late Medieval and Renaissance Northern Painting and Illumination* 15 (Turnhout: Brepols/Paris: BnF, 2007), 99–109; and Albert Châtelet, “Les Heures de Dunois,” *Art de l'enluminure* 25 (2008): 12–73, esp. 16–19.

6. For a provisional list of manuscripts containing miniatures in the manner of the Dunois Master, see Gregory Clark, *Art in a Time of War: The Master of Morgan 453 and Manuscript Illumination in Paris during the English Occupation (1419–1435)* (Toronto: Pontifical Institute of Mediaeval Studies, 2016), 270–78; see also Christie's auction catalogues *Illuminated Manuscripts from the Collection of Maurice Burrus* (London, 25 May 2016), lot 9, and *Valuable Books and Manuscripts* (London, 13 July 2016), lot 113. For overviews of the Dunois Master's place in fifteenth-century Parisian painting, see François Avril and Nicole Reynaud, *Les Manuscrits à peintures en France, 1440–1520* (Paris: Bibliothèque nationale–Flammarion, 1993), 35–37; and Dominique Thiébaud, Philippe Lorentz, and François-René Martin, *Primitifs français. Découvertes et redécouvertes* (Paris: Réunion des Musées Nationaux, 2004), 89–92. The most recent study of his eponymous manuscript is Richard Gameson, “Sin and Salvation in the Dunois Hours,” in *Illuminating the Middle Ages: Tributes to Prof. John Lowden from His Students, Friends and Colleagues*, ed. Laura Cleaver, Alixe Bovey, and Lucy Donkin,

of King Charles VII, notably Jean de Dunois (from whom the artist takes his now-customary name⁷) and the aforementioned Prigent de Coëtivy.

After Prigent was killed during the siege of Cherbourg (July 1450), his eponymous book of hours appears to have passed to his brother, Alain de Coëtivy (1407–74), a high-ranking ecclesiastic who, from the age of thirty, held a sequence of bishoprics and who was, at the time of Prigent's death, cardinal of Sta. Prassede in Rome. Alain had the many coats of arms in the manuscript repainted, replacing the original quartered shield that had commemorated Prigent and his wife, Marie de Rais, with the armorial of the Prigent family alone, in one case surmounted by a cardinal's hat.⁸

A recent exhibition afforded the Coëtivy Hours the public attention it richly deserves.⁹ The associated catalogue provided an excellent general account of the manuscript and reproduced a wide selection of its many illuminations.¹⁰ Complementing that work, the present study focuses on a supremely important aspect of the book that could not be explored in detail in such contexts, namely the range and nature of the Marian devotions and imagery. For in addition to the standard Marian elements common to *horae*, the Coëtivy Hours features more than 120 pages of further prayers addressed to the Virgin. The textual content of this extensive section is here examined, and the numerous accompanying miniatures are analyzed: while many of the images present versions of well-known iconographies, a few are more unusual. Discussion concentrates on how this amplification of the Marian devotions relates to the book's patron and his circumstances.

Then, in a separate section, results are reported from a scientific examination of the Coëtivy Hours that was undertaken subsequent to the exhibition. The focus here is on the

Library of the Written Word—The Manuscript World 79 (Leiden: Brill, 2020), 369–94.

7. When first recognized as an individual personality (Eleanor Spencer, “Gerson, Ciboule and the Late Bedford Master's Shop [Brussels, Bibl. Royale, MS IV.111, Part II],” *Scriptorium* 19, no. 1 [1965]: 104–8), the artist was referred to as “The Chief Associate of the Bedford Master”; he was renamed “Maître de Dunois” by Avril and Reynaud, *Manuscrits à peintures*, 35–37.

8. Fol. 283r.

9. “Miniature Masterpiece: The Coëtivy Hours”: Dublin, Chester Beatty Library, 9 March–2 September 2018.

10. Jill Unkel with Laura Cleaver and Kristine Rose Beers, *Miniature Masterpiece: The Coëtivy Hours* (Dublin: Chester Beatty Library, 2018). As the numbering of the illustrations in this publication starts anew for each chapter, both page and illustration numbers are given in the references that follow; all the decorated pages are available online via Chester Beatty Digital Collections (Western Collection). Hitherto the standard accounts had been James et al., *Descriptive Catalogue*, and Donal Byrne, “The Hours of the Admiral Prigent de Coëtivy,” *Scriptorium* 28, no. 2 (1974): 248–61.

nature of the underdrawings (revealed by infrared imaging) and on the choice of pigments (identified by Raman spectroscopy and diffuse reflectance spectroscopy). The significance of the palette and of the artistic practices that were thereby brought to light is assessed.

The Virgin Mary in the Coëtivy Hours

At the heart of all books of hours, the defining feature of which is the Little Office of the Blessed Virgin, is Mary; in the Coëtivy Hours, however, the appearances of the Mother of God are unusually numerous, and her presence is accordingly the more emphatic. Whereas many *horae*, including the Dunois Hours, move directly from the Office of the Dead to the suffrages, in the Coëtivy Hours a long series of additional devotions stands between them. These begin with the Psalter of St. Jerome, the Athanasian Creed, mass prayers, the prayer *Deus propitius esto mihi peccatori*, and the Verses of St. Bernard;¹¹ thereafter appear twenty-one prayers to one or another part of the Godhead, a prayer to the Holy Cross, and the metrical litany of Peter of Luxembourg.¹² There follow no fewer than twenty-six prayers or devotions (many of them lengthy) to the Virgin Mary, with two more Marian texts following the suffrages (the second suffrage is itself for Mary).¹³ While a few of these texts regularly occur in *horae*, many do not: only eight are commonly found in the 300 or so copies described in Victor Leroquais' monumental catalogue of the books of hours in the Bibliothèque nationale de France; another eight of the texts appear there occasionally, while twelve are unwitnessed there.¹⁴ This does not mean

that the texts are unknown in other contexts or even unparalleled in *horae*; but it does demonstrate their rarity in a substantial cross section of examples, rich in the sort of copies that Prigent de Coëtivy and the Dunois atelier are likely to have known. A concerted effort was evidently made to include in the Coëtivy Hours as many Marian devotions as possible. Since this was a major endeavor, occupying over 120 pages, it would unquestionably have been reflected in the cost of the book and must surely therefore have been mandated by the patron. Whatever the truth of the point, it is manifestly the case that the importance of Mary is magnified by these many supplementary prayers and by the images that invariably accompany them. The nature of the Marian piety that is displayed so conspicuously and at such length in the Coëtivy Hours deserves further attention.

The content of the copious Marian prayers is fairly standard. There is fulsome, formulaic acclamation of Mary in her various guises as ever-virgin Mother of God,¹⁵ as martyr on account of the suffering she endured witnessing the Passion of her son,¹⁶ as the most powerful figure after God, as door to Paradise,¹⁷ as one who is both doctor and medicine to frail humankind (hence mother to orphans, consoler of the desolate, restorer of the lost, reformer of humanity, exulter of the just, and other such epithets),¹⁸ and as the most efficacious intercessor on its behalf.¹⁹ Such praise is invariably accompanied by requests for Mary to improve, guide, and regulate the life of her devoted suppliant; to hear his prayer; to console, defend, and purify him from sin,²⁰ repelling the assaults of the devil;²¹ to grant him a good life and eternal rest; to intercede for him, his relatives, and all sinners;²² to be

11. Beginning respectively on fols. 118r, 133r, 135v, 141r, and 143r. Note that almost all the leaves with major illuminations (thus including the first folio, if not more, of each textual section) were excised when the manuscript was the personal property of the Beattys; though preserving their older foliation, these are individually mounted and kept separately from the main body of the book. For printed versions of the Psalter of Jerome and *Deus propitius*, see *Horae Eboracensis: The Prymer or Hours of the Blessed Virgin Mary . . .*, ed. John Wordsworth, Surtees Society 132 (Durham: Andrews and Company, 1920), 116–22 and 125.

12. Fols. 144v–192v.

13. The prayers and devotions occupy fols. 193r–253v: see Appendix I. The suffrage is on fol. 255r.

14. Victor-Martial Leroquais, *Les Livres d'heures manuscrits de la Bibliothèque nationale*, 3 vols. (Paris/Mâcon: Protat Frères, 1927), with *Supplément* (Mâcon: Protat Frères, 1943). Common: Appendix I, nos. 3, 4, 6, 11, 19, 23–24, and 28. Uncommon: nos. 2, 5, 7, 10, 12, 18, 21 (expanded in comparison to the incipit and explicit given by Leroquais), and 25. Unwitnessed: nos. 1, 8, 9, 13–17, 20, 22, 26–27. Equally, of the prayers to the Deity, only two are (by the same criteria) common; seven are uncommon, and twelve are unwitnessed. Given, on the one hand, the fluidity of some such texts and, on the other, the brevity of the incipits and

explicit supplied by Leroquais, it is entirely possible that one or two of our items that are unrecognizable in his catalogue are actually present in the manuscripts themselves in alternative forms; however, the reclassification of a few items from “unwitnessed” to “uncommon” would make little difference to the general picture, and no difference to the validity of the main point here.

15. E.g., Appendix I, no. 5. Here and in the following notes, examples of these near-ubiquitous ideas are generally limited to cases where the relevant part of the text is actually included in the extract that is given in Appendix I.

16. E.g., nos. 1 (“*martir cum martiribus transgladiata morte sacratissima filii tui domini nostri iesu christi*”), 2, 3, 15 and, above all, 11.

17. E.g., nos. 4 (“*ianua regni celorum per quam post deum totus vivit orbis terrarum*”) and 6 (“*virgo dei genitrix maria . . . ianua regni celorum*”).

18. E.g., nos. 2, 3, 10, 13, 19, and 27.

19. E.g., nos. 8 and 13 (“*Ave per misericordiam domini nostri saluatricis*”).

20. E.g., no. 17 (“*ut per te purificatus a sordibus peccatorum*”).

21. E.g., nos. 7, 8, and 16.

22. E.g., nos. 20, 21, and 24.

present at the hour of his death²³—even to reveal exactly when this will occur²⁴—to receive his soul;²⁵ to usher him, after death, into the presence of Christ;²⁶ to assist him at the Last Judgment,²⁷ and to open the gates of heaven.²⁸ Indeed, she is asked to guard him from all evil, past, present, and future,²⁹ to aid him in everything,³⁰ and even to grant him eternal life.³¹ Mary is saluted as second only to God whose ever-pure *genetrix* she was,³² as the being to whom all heaven and earth are subject,³³ and as the uniquely influential (not to mention approachable) intercessor;³⁴ those who honor her will be rewarded on earth and in heaven.³⁵

The texts do not appear to have been arranged in any particular order beyond the facts that, in the main run, those in Latin precede those in French,³⁶ while the final item of all is purely a hymn of praise.³⁷ There is no obvious progression in terms of theme or intensity, while there is much repetition both of ideas and of phraseology. Yet in whatever order these prayers were used, and be it singly or severally, they make Mary the focus of devotion after devotion and of plea after plea designed to secure the suitably adoring and self-abasing suppliant comfort and prosperity in the present world with its manifold threats and uncertainties,³⁸ and as smooth as possible a path to heaven.³⁹

23. E.g., nos. 5 (“ut sis michi miserrimo peccatori in adiutorem in die exitus mei”) and 25 (“qu’a ma fin vous vueillies estre presente”); cf. nos. 15 and 21 (“ut letifices me in hora defunctionis mee”).

24. E.g., nos. 7 and 14 (“et annuncies mihi diem et horam obitus mei”).

25. E.g., no. 8 (“et quando anima mea assumpta fuerit de corpore meo accipere eam digneris”).

26. E.g., no. 16 (“Et post obitum nostrum dignare nos presentare carissimo atque dulcissimo filio tuo”).

27. E.g., nos. 9, 11 (“inflamatus et accensus per te virgo sim defensus in die iudicii”), 14, and 15.

28. E.g., nos. 8 and 27 (“porta patens celi”).

29. E.g., nos. 5 (“ut me famulum tuum ab omnibus malis preteritis presentibus et futuris me custodias”) and 18 (“Custodi me te deprecor a nociva fragilitate carnis a viciis a criminibus, etc.”).

30. E.g., no. 6 (“et esto michi pia et in omnibus auxiliatrix”).

31. E.g., no. 3 (“et vitam eternam michi tribuas”).

32. E.g., nos. 4, 6 (“per quam post deum totus vivit orbis terrarum”), 8, and 10.

33. E.g., nos. 9 and 10 (“Tu es enim potencior super omnes”).

34. E.g., nos. 10 (“Nullus enim confundetur sicut credo nec perdetur. Qui se tibi commendabit, qui te pure inuocabit”) and 28 (“Ut ad uotum consequaris | quicquid uirgo postularis | a iesu dulcissimo”).

35. E.g., no. 28 (“Pater seculorum dabit te colentibus congruentem hic mercedem et felicem poli sedem regnis in celestibus”).

36. Nos. 1–21 and 22–26 respectively.

37. No. 28.

38. E.g., nos. 2, 3, and 21.

39. On Marian prayers in relation to *horae* more generally, see Rachel Fulton Brown, *Mary and the Art of Prayer: The Hours of*

The repertoire of Marian imagery in the Coëtivy Hours is subtly different in import from the words of the prayers it accompanies: while the many Marian texts in the Coëtivy Hours praise the Virgin and attempt to enlist her aid, the imagery celebrates her in her own right. Mary is generally the most frequently occurring subject in any book of hours.⁴⁰ She is depicted twenty times in the Dunois Hours, for example—thirteen times as one figure among many in a narrative scene (the Nativity, the Crucifixion, the Last Judgment, and so on) and four times as the principal subject of a miniature, the borders of one of which (the Annunciation) include three more images of her.⁴¹ In less exalted products of the same workshop she appears about a dozen times.⁴² In the Coëtivy Hours, by contrast, Mary is featured in a formidable sixty miniatures and is the primary subject of more than a third of them. This means that on average, in relation to the volume as a whole, she appears once every six folios. The elevated number of effigies of the Virgin renders her omnipresent for the user of this book—a visual equivalent of the spiritual ideal that underpinned *horae* as a genre, and one that is articulated in the Marian prayers in the Coëtivy Hours itself.⁴³

The Hours of the Virgin within the Coëtivy Hours are punctuated by the typical cycle of miniatures for a fifteenth-century northern French copy,⁴⁴ comprising the Annunciation (Fig. 1), Visitation, Nativity, the Annunciation to the Shepherds, the Adoration of the Magi, the Presentation in the Temple, the Flight into Egypt, and the Coronation of the Virgin (Fig. 2), all scenes in which Mary is a principal figure. She also appears in the narrative cycles that accompany the Hours of the Spirit and of the Cross, fulfilling her traditional roles (swooning beside the crucifixion at None in the Hours of the Cross, witnessing Christ’s ascension at Prime

the Virgin in Medieval Christian Life and Thought (New York: Columbia University Press, 2018).

40. Depictions of the Godhead are occasionally more numerous; however, as the triune deity appears in three separate forms (Father, Son, Holy Ghost), sometimes together in a single miniature, one is not comparing like with like; it is unusual for any one form of the Godhead (even Christ) to appear more frequently than Mary.

41. Narrative: fols. 32v, 66v, 81v, 93v, 104v, 99r, 139v, 136v, 142v, 145v, 152v, 148v, 193v. Primary: fols. 22v, 27v, 37r, 114r. All are reproduced in Châtelet, “Heures de Dunois.”

42. E.g., Cambridge, Fitzwilliam Museum, MS McClean 81; London, British Library, MS Add. 18751, a relevant page from which is reproduced in Janet Backhouse, *Illumination from Books of Hours* (London: British Library, 2004), ill. 68.

43. E.g., no. 18 (“et a te nunquam in perpetuum separari permittas”).

44. As conveniently presented in Roger S. Wieck, *Time Sanctified: The Book of Hours in Medieval Art and Life* (New York: Braziller, 1988), 60–66, pls. 1–8.



Figure 1. *Annunciation, Office of the Blessed Virgin Mary, Matins, fol. 21r, Coëtivv Hours, Dublin, Chester Beatty Library, MS W082* (photo: © Trustees of the Chester Beatty Library, Dublin). See the electronic edition of *Gesta* for color versions of most images.

in the Hours of the Spirit, and receiving the fire of the Holy Ghost at Terce).⁴⁵

The many Marian miniatures that accompany the supplementary prayers, by contrast, are a sequence of individual images rather than a cycle: they are not arranged according to any observable principle, narrative or thematic (exactly as is true of these texts themselves, it will be recalled); nor for the most part is there any particular, as opposed to generic, correspondence between the iconography of a given case and the text of the prayer it introduces.⁴⁶ But then, unlike

45. Fols. 61r, 47v, and 52r. Compare *ibid.*, 89–93, pls. 10–11.

46. One exception is the Crucifixion deployed for no. 11 (“Stabat mater”), fol. 219v. Other possible cases are: the Lamentation–Pietà used for no. 3 (“Obsecro te”), a prayer that dwells on Mary’s grief occasioned by Christ’s suffering on the cross (198v); and the Virgin of Sun and Moon that appears at no. 28, the hymn on the celestial joys of Mary in which (stanza 2) she is likened to the rays of the sun.



Figure 2. *Coronation of the Virgin, Office of the Blessed Virgin Mary, Compline, fol. 69v, Coëtivv Hours, Dublin, Chester Beatty Library, MS W082* (photo: © Trustees of the Chester Beatty Library).

the Hours which would, in principle, be worked through each day in order at the prescribed times, these were ancillary texts to be read as and when the user felt the need. Again, in contrast to the Hours with their long-established traditions of illustration, most of these supplementary texts had no such visual lineage. The Dunois Master thus faced a challenge: how to produce a plethora of images of the Virgin that could sit comfortably alongside a series of repetitious prayers while offering some illustrative variety. Apart from the occasional reduplication of a scene from the Nativity cycle (Fig. 3),⁴⁷ the solution he resolved upon was a sequence of hieratic representations of Virgin and Child, exploiting a range of settings and accoutrements to add variety and nuance to this resonant icon. Even without many specific correspondences to the *ipsissima verba* of their prayers, such images were eminently suitable devotional accompaniments for the general sentiments therein. And collectively, by

47. The Annunciation reappears on fol. 225v; the Nativity on fols. 223v and 230v, and also on fol. 326r (within the Articles of Faith).



Figure 3. *The Nativity, prayer to the Blessed Virgin Mary* (Appendix I, no. 14), fol. 223v, *Coëtivy Hours*, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

highlighting various different aspects of Mary, they amount to a sequential exploration of her nature, spirituality, and importance. The content of this unique mariological cycle merits closer inspection.

The Marian imagery in the *Coëtivy Hours* proclaims that the Virgin was miraculously conceived and born without sin (Fig. 4),⁴⁸ that she was part of an extended holy family with Anne and Elizabeth,⁴⁹ and was destined to become the Mother of God.⁵⁰ Her piety before and after the Nativity is shown by

48. Fols. 12r (the meeting of Anne and Zacharias, marking the Immaculate Conception in the calendar, 8 December), 255r (the birth of Mary; a swaddled newborn, she is already crowned and haloed), and 300r (Blessed Virgin Mary as part of a trinity with Anne and the Christ child, for Anne's suffrage): Unkel, *Miniature Masterpiece*, 61 (ill. 1) and 65 (ill. 12).

49. Fols. 300r (Unkel, *Miniature Masterpiece*, 65 [ill. 12]) and 307r (Blessed Virgin Mary present beside Elizabeth's bed at the birth of John the Baptist, for John's suffrage); also fol. 255r.

50. Fol. 225v (the Annunciation): Unkel, *Miniature Masterpiece*, 61 (ill. 3); also fol. 21r (the Annunciation): *ibid.*, 12 (ill. 9) and 29 (ill. 4).



Figure 4. *Nativity of the Virgin, suffrage for the Blessed Virgin Mary*, fol. 255r, *Coëtivy Hours*, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

her application to prayer and reading, activities she undertakes repeatedly, in domestic, ecclesiastical, and symbolic settings alike (Figs. 5, 6, 8, and 14),⁵¹ and by her engagement in weaving sacred vesture (ably helped by an angel), something that she accomplished (according to the *Protoevangelium* of James) while she was pregnant with Jesus (Fig. 7).⁵²

51. Fols. 201v, 209r, 217v, 225v, 229v, 230v, 231v; also fols. 21r, 52r, 151r, and 300r.

52. Fol. 193r: Unkel, *Miniature Masterpiece*, 61 (ill. 2). Her pregnancy at the time is occasionally made explicit, e.g., on an early fifteenth-century panel in Berlin (Berlin, Gemäldegalerie, no. 1874: Stephan Kemperdick, *Deutsche und Böhmische Gemälde, 1230–1430, kritischer Bestandskatalog* [Petersberg: Michael Imhof, 2010], no. 22), where a golden Christ child glows forth from her womb as she spins. *The Apocryphal Gospels: Texts and Translations*, ed. Bart Ehrman and Zlatko Pleše (Oxford: Oxford University Press, 2011), 50–52; *The Apocryphal New Testament: A Collection of Apocryphal Christian Literature in an English Translation*, ed. James K. Elliott (Oxford: Oxford University Press, 1993), 48–67, at 61 (section 10). Also the Gospel of Pseudo-Matthew, c. 9 (Elliott, ed., *Apocryphal New Testament*, 89), and “De natiuitate Sanctae Mariae uirginis,” in Jacobus de Voragine, *Legenda aurea. Goldene Legende*, ed. Bruno

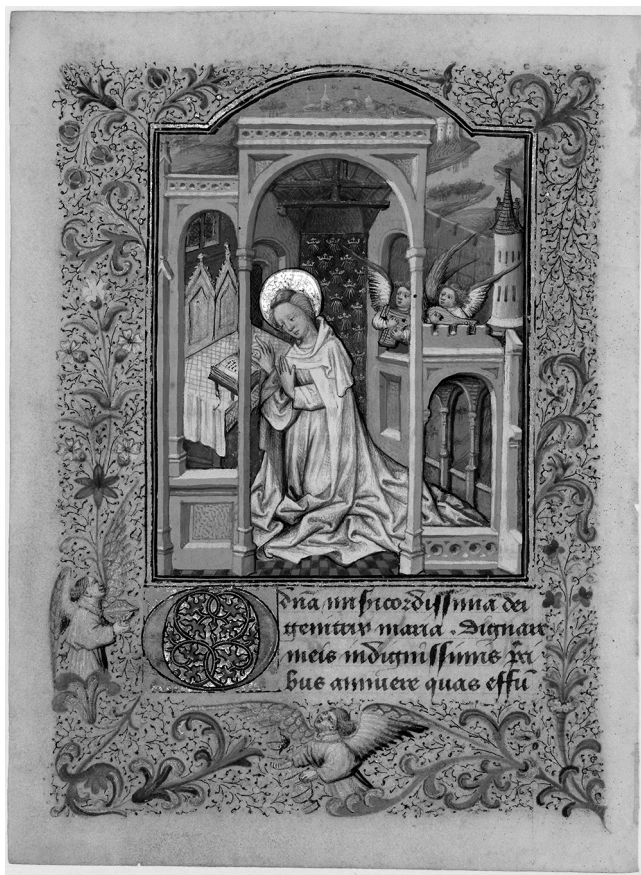


Figure 5. *The Virgin Mary at prayer, prayer to the Blessed Virgin Mary* (Appendix I, no. 20), fol. 229v, *Coëtivy Hours*, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

Her elevated spirituality is underlined by juxtaposition with her human husband, Joseph (Figs. 8–9; also Fig. 3): while she reads or attends to the Christ child, he dozes, his senescence underscoring the physical reality of her continuing state of virginity;⁵³ on one occasion he watches a cooking pot, evoking contemporary domestic life while broadcasting once again the contrast between his mundane humanity and Mary's holiness.⁵⁴ Mary worships the newborn Christ.⁵⁵ She suckles the Christ child (Fig. 3); and both she and he represent sources of the living water of spiritual nourishment—a theme alluded to by a well within the very room in which they sit (Fig. 10).⁵⁶ Mary nurtures the baby or infant Jesus, whose future passion

Hauptli, *Fontes christiani*, 2 vols. (Freiburg im Breisgau: Herder, 2014), 2: no. 131 (1732–56, at 1742).

53. Fols. 217v, 228v, 230v: Unkel, *Miniature Masterpiece*, 43 (ill. 14) and 64 (ill. 10).

54. Fol. 223v.

55. Fol. 326r: Unkel, *Miniature Masterpiece*, 43 (ill. 15).

56. Fol. 237r: *ibid.*, 62 (ill. 6). Cf. Song of Songs 4.14 (*puteus aquarum uiuentium*) and John 4.4–25.



Figure 6. *Virgin and Child (Trinity) in hortus conclusus, prayer, O intemerata* (Appendix I, no. 4), fol. 201v, *Coëtivy Hours*, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

is symbolized by attributes such as a goldfinch,⁵⁷ while her role as *vas electum* (the chosen vessel of celestial grace) and *vas virtutum* (the vessel of virtues) is evoked by the various vases and containers that appear.⁵⁸ The red flowers or cherries that are shown are emblems of both mother and son (alluding to sweetness and suffering respectively), as is the apple,

57. Goldfinches appear on fols. 194v and 213v.

58. E.g., fols. 194v, 215v, and 231v. For the former idea cf. the famous sequence (hymn) for the Nativity of the Virgin credited to Adam of Saint-Victor: “Salve mater salvatoris | vas electum, vas honoris | vas caelestis gratiae | ab aeterno vas provisum | vas insigne vas excisum | manu sapientiae”: *Analecta Hymnica Medii Aevi*, ed. Guido Maria Dreves, Clemens Blume, et al., 55 vols. (Leipzig: Reissland, 1888–1922), 54: no. 245; also *One Hundred Latin Hymns, Ambrose to Aquinas*, ed. Peter G. Walsh with Christopher Husch, *Dumbarton Oaks Medieval Library* 18 (Harvard: Harvard University Press, 2012), no. 91. For the latter idea, see verse 3 of the hymn *Gaude flore virginali* that occupies fols. 305v–306v of the *Coëtivy Hours* (Appendix I, no. 28): “Gaude splensens vas virtutum.”



Figure 7. *The Virgin weaving, prayer to the Blessed Virgin Mary* (Appendix I, no. 1), fol. 193r, Coëtivy Hours, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

which articulates the role of Christ as the new Adam and of Mary as the new Eve, bringing salvation to fallen mankind.⁵⁹ The sacrality of all these scenes is underlined by attendant angels who serenade, minister, or help the Christ child to walk and to pick flowers.⁶⁰ Yet the core content here, constantly repeated, is Mary and Jesus enjoying an intimate relationship as mother and child, something central to the perception of the Virgin as the uniquely influential intercessor with her divine son.⁶¹ Correspondingly, Mary suffers as Christ suffers during the Passion.⁶²

59. E.g., fols. 228v and 247v. Cf. Adam of Saint-Victor (as previous note): “flos de spina, spina carens | flos spineti gloria . . . rosa patientiae.” Another apple may appear on fol. 221r; however, the minuscule scale makes it impossible to establish whether the tiny red object in question is an apple or a pomegranate.

60. Fols. 194v, 215v, 231v, and 201v respectively: Unkel, *Miniature Masterpiece*, 65 (ill. 11), 41 (ill. 12), and 64 (ill. 9).

61. E.g., fols. 194v, 201v, and 228v: Unkel, *Miniature Masterpiece*, 64 (ills. 9 and 10) and 65 (ill. 11).

62. Fols. 156v, 198v, 224v, and 329r: Unkel, *Miniature Masterpiece*, 17 (ills. 21 and 19); cf. note 16 above.

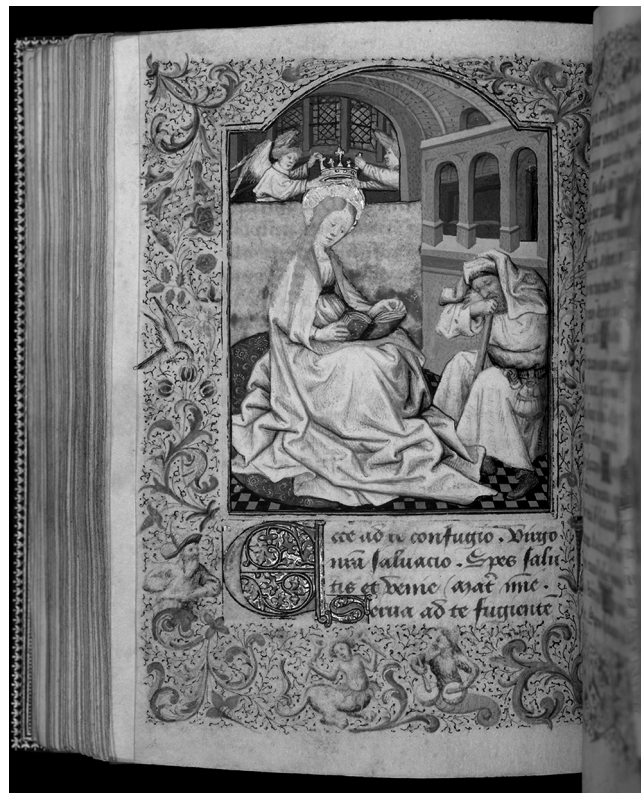


Figure 8. *The Virgin Mary and Joseph, prayer to the Blessed Virgin Mary* (Appendix I, no. 10), fol. 217v, Coëtivy Hours, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

In these scenes, Mary is frequently shown seated on the ground;⁶³ twice, by contrast, she appears standing (once on a pedestal, thereby assimilated to a devotional statue: Fig. 11)⁶⁴ and twice enthroned (Figs. 12 and 21).⁶⁵ The contrasting messages conveyed by these postures—whether she is the Madonna of Humility or the Queen of Heaven—are reinforced or complemented, as the case may be, by the presence or absence of a crown,⁶⁶ a foot cushion,⁶⁷ and a canopy.⁶⁸ On a couple of occasions she is overtly depicted as the Queen of Heaven, kneeling before, or seated beside, God (Figs. 13 and 2). As for the contribution made by the settings, a stylized oratory highlights Mary’s role as symbol of the Church (Figs. 14 and 5),⁶⁹ while the *hortus conclusus* (enclosed garden) that she

63. Fols. 194v, 201v, 215v, 217v, 227v, 231v, and 303r.

64. Fols. 211r and 213v.

65. Fols. 209r and 221r.

66. With: fols. 201v, 204v, 209r, 213v, 215v, 222v, 235r, 237r. Without: fols. 194v, 225v, 228v, 229v, 231v, 247r.

67. Fols. 237r and 247r.

68. Fols. 194v, 209r, 211r, 213v, 215v, 221r, and 231v.

69. Fol. 227v: Unkel, *Miniature Masterpiece*, 13 (ill. 10).



Figure 9. *Virgin and Child with Joseph in a garden, prayer to the Blessed Virgin Mary* (Appendix I, no. 19), fol. 228v, *Coëtivy Hours*, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

occupies on four occasions broadcasts her continuing virginity and her status as the doorway to the Paradise that mankind lost at the Fall; the symbolism of the garden is enhanced by the ebullient lilies and/or red and white roses therein,⁷⁰ while in one rendering, all three parts of the Trinity are present.⁷¹ In addition, Mary is thrice depicted in the guise of the portentous woman of the sun and moon, an image redolent of great power that is both terrestrial and cosmic, and one that could also evoke the immaculate conception (Figs. 15–16).⁷² These are all familiar roles and iconographies that do not re-

70. Fols. 201v, 228v, 231v, and 303r. Cf. Song of Songs 4.12; Ezekiel 7.10.

71. Fol. 201v.

72. Fols. 204v, 222v, and 305v: Unkel, *Miniature Masterpiece*, 61 (ill. 4) and 38 (ill. 7). Cf. Revelation 12.1 and Jacobus de Voragine, “De nativitate Domini” (*Legenda aurea*, no. 6, ed. Häuptli, 1:188–90); also Mirella Levi d’Ancona, *The Iconography of the Immaculate Conception in the Middle Ages and Early Renaissance* (New York: College Art Association of America, 1957), 26–28.



Figure 10. *Virgin and Child in an interior with a well, Fifteen Joys of the Blessed Virgin Mary* (Appendix I, no. 24), fol. 237r, *Coëtivy Hours*, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

quire further exposition here;⁷³ the key point in the present context is the sheer number and range of them.

The same is true of most of the cases where Mary is shown as one element within a miniature devoted to a broader subject. Nevertheless, a few of these scenes do merit further comment. Prime among them is the illumination that heads a venerable prayer to Christ, wherein the miserable sinner, readily confessing his manifold faults and imploring the company of heaven (in first place Mary) to intercede for him, begs for comprehensive remission of his sins now and in the future (Fig. 17).⁷⁴ The text begins by invoking the Incarnation—“O

73. The most convenient general conspectus of Marian iconography is Gertrud Schiller, *Ikongraphie der christlichen Kunst* 4.2: *Maria* (Gütersloh: Gütersloher Verlaghaus Gerd Mohn, 1980). For a more recent (partial) treatment, focusing on sculpted images of the Virgin and Child, see Robert Suckale, ed., *Schöne Madonnen am Rhein* (Bonn: LandesMuseum/Leipzig: Seemann, 2009).

74. “Indulgeat mihi omnia peccata hic et in futuro,” fol. 151r: Unkel, *Miniature Masterpiece*, 83 (ill. 4).

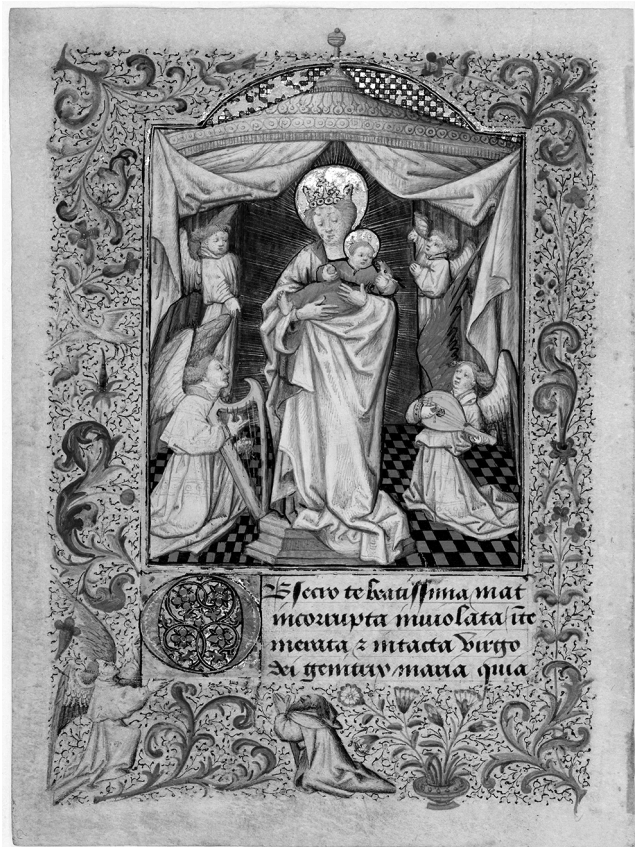


Figure 11. *Virgin and Child with a goldfinch, prayer Obsecro te* (Appendix I, no. 8), fol. 213v, Coëtivy Hours, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

lord Jesus Christ who have come into this world from the breast of the Father on account of us sinners”⁷⁵—and this was evidently the inspiration for the illumination. The imagery (which occupies the border as well as the framed picture space) shows the orb of the world surrounded by the seven spheres of the heavens duly labelled Saturn, Jupiter, Mars, Sun, Venus, Mercury, and Moon in accordance with medieval—ultimately Greek—cosmology, and populated with angels (the “spiritual intelligences” of the spheres); it is framed by the twelve signs of the zodiac. In astrological terms widely current in the fifteenth century, the planets also evoke the gamut of the human race, whose varied characteristics were defined by the sign under which they were born—miserable if they were children of Saturn, fortunate if they were born

75. “Domine iesu christe qui in hunc mundum de sinu patris propter nos peccatores aduenisti”; a version is printed in *A Pre-Conquest English Prayer-Book: BL MSS Cotton Galba A.XIV and Nero A.II* [ff. 3–13], ed. Bernard James Muir, Henry Bradshaw Society 103 (Woodbridge: Boydell Press for the Henry Bradshaw Society, 1988), 619 (no. 25).



Figure 12. *Virgin and Child with apple or pomegranate, prayer to the Blessed Virgin Mary* (Appendix I, no. 12), fol. 221r, Coëtivy Hours, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

under Jupiter, bellicose if under Mars, and so on.⁷⁶ The zodiac, each element of which was governed by a planet, betokened similar qualities, while also alluding to physical health, for the ebb and flow of humors in different parts of the human body was held to be determined by the interaction of lunar and zodiac cycles. In addition, it evoked the unceasing round of earthly time in contradistinction to the eternity of heaven. From God the Father, enthroned amidst cherubim at the center of the firmament (an area which, given the precise identification of the other celestial zones, evidently represents the Empyrean Heaven), descends a cross-carrying baby Jesus, preceded by the Dove of the Holy Spirit, toward (in a chamber contained within the lower curve of the world, occupying the lower border) the Virgin Mary annunciate. The image is thus a complex yet concise evocation of the cosmic dimension of

76. Spelled out with vivid illustrations in the so-called Medieval House Book of the late fifteenth century (olim Schloss Wolfegg, s.n.; facsimile: *Das Mittelalterliche Hausbuch*, ed. Christoph Graf zu Waldburg Wolfegg, 2 vols. [Munich/New York: Prestel, 1997]).



Figure 13. Coronation/blessing of Virgin above the orb of the world and the heavens, prayer to the Blessed Virgin Mary (Appendix I, no. 25), fol. 241v, Coëtivy Hours, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).



Figure 14. Virgin and Child with flowers (daisies?), prayer to the Blessed Virgin Mary (Appendix I, no. 18), fol. 227v, Coëtivy Hours, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

the Incarnation as well as its salvific significance for humans of every sort that simultaneously highlights Mary's unique role as conduit between heaven and earth, between mortal life in all its variety, fragility, and instability and eternity with its ever-enduring constancy and certainty.

That the Virgin sustains the holy while they are in the world is broadcast by the image heading the suffrage to St. Avia, for here Mary administers communion to the saint while she is in prison for her faith.⁷⁷ That this is the customary scene for Avia when she is depicted⁷⁸ makes it none the less resonant as part of the present manuscript's extended

77. Fol. 297r.

78. As, e.g., in Cambridge, Fitzwilliam Museum, MS 66 (*horae*; Use of Rome; origin, Amiens, first quarter of the fifteenth century), fol. 115r; and Manchester, John Rylands University Library, MS lat. 164 (*horae*, Use of Paris; Paris, mid-fifteenth century): Jan Wilkinson et al., *Riches of the Rylands. The Special Collections of The University of Manchester Library* (Manchester: Manchester University Press, 2015), no. 2.8. See also Leroquais, *Livres d'heures*, 1:liii; and Antoine De Schryver, *The Prayer Book of Charles the*

exploration of the roles of the Virgin. Mary's all-important function as intercessor for ordinary secular society is underlined in the miniature that accompanies the ancient morning prayer addressed to Christ that was sometimes credited to St. Jerome: "O Lord Jesus Christ, when I arise in the morning, direct and govern my deeds, my words and my thoughts" (Fig. 18).⁷⁹ A layman is shown awake in bed within a well-appointed chamber, being brought his clothes (and breakfast) by his servants (their procession continuing in the borders); as he is about to rise, dress, and begin his active day (ideally sanctifying it with this prayer, which begs for divine guidance to despise worldly things and to love heavenly ones), the Virgin Mary, depicted in heaven above, is already praying

Bold: A Study of a Flemish Masterpiece from the Burgundian Court (Los Angeles: J. Paul Getty Museum, 2008), 286–87.

79. "Domine iesu christe mane cum surrexero intende et gubernas actus meos uerba mea et cogitationes meas." Fols. 175r–177r. Printed: *Patrologia latina*, ed. Jacques-Paul Migne, 221 vols. (Paris: Garnier Frères, 1844–64), 101: cols. 490–91.



Figure 15. *Virgin and Child of the Sun and Moon, an Ave Maria* (Appendix I, no. 13), fol. 222v, *Coëtivy Hours*, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).



Figure 16. *Virgin and Child of the Sun and Moon, Seven Joys of the Virgin* (Appendix I, no. 28), fol. 305v, *Coëtivy Hours*, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

before the Deity, doubtless interceding on the gentleman's behalf.

The ideal that Mary might be in attendance at the hour of one's death is made explicit in the miniature for *O tres certaine esperance*, one of the many prayers in the manuscript that implore her to be present then (Fig. 19).⁸⁰ A woman lies on her deathbed, watched over by a nun and a laywoman; although a devil lurks beside her pillow, a large, radiant Virgin Mary surrounded by seraphim is at the window, hands reaching forward ready to receive the soul of the dying lady, into whose eyes she gazes. Likewise for the prayer *O gloriosa dei genitrix*, it is Mary who is shown receiving into heaven (on behalf of the Trinity, depicted behind her) the pure soul of one who has (presumably) lived a good life and has evidently died a good death (all those attending him are monastics or friars, he has a crucifix at the foot of his bed, with no demon anywhere to be seen) (Fig. 20).⁸¹ And at the Last Judgment—

80. Fol. 235r: Appendix I, no. 23.

81. Fol. 226v: Appendix I, no. 17.

as the very last image in the book reminds us—Mary will be at the right hand of the cosmic Christ, still interceding for the faithful whose souls are in purgatory.⁸²

As noted earlier, these are all well-established roles and (for the most part) iconographies, recurring in numerous other *horae* and elsewhere.⁸³ What is remarkable here is the

82. Fol. 356v. This heads the final item within the Seven Articles of Faith (in French verse); its rubric is, "Le vii^e article est de la venie nostre seigneur au jour du jugement": Unkel, *Miniature Masterpiece*, 79 (ill. 35). A similar image was used on fol. 74v for Compline in the Hours of the Holy Spirit.

83. This last one (fol. 356v), to take a single instance, is akin to the part of the image used for the prayer "Deus propitius" in the Dunois Hours (fol. 32v: Châtelet, "Heures de Dunois," 40) and to that prefacing "Doulz dieu doulz pere, sainte trinite et un dieu" in Cambridge, Fitzwilliam Museum, MS McClean 81, fol. 186r. Several variations on the same basic design are conveniently reproduced in Nicole Reynaud, "Les Heures du chancelier Guillaume Jouvenel des Ursins et la peinture parisienne autour de 1440," *Revue de l'art* 126 (1999): 23–35, ill. 4, 7, 8, 9, and 10.



Figure 17. *The Trinity, Incarnation, Annunciation, with the cosmos and zodiac, prayer to Christ, fol. 151r, Coëtivy Hours, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).*

number of them that have been assembled and, correspondingly, the range of functions that the Virgin Mary is actually shown fulfilling in the Coëtivy Hours. Collectively these miniatures amount to a sequential visual exploration of the Mother of God, her nature and her roles, illustrating her relationship on the one hand with the Godhead and, on the other, with sinful man, underlining her crucial role in helping the latter to achieve salvation.⁸⁴ All books of hours by their nature focus on Mary, but some do so more than others, and the Coëtivy Hours does so far more than most.⁸⁵ As such, the volume exemplifies how individual *horae*, particularly

84. For convenient overviews of the range of functions credited to the Virgin and the spectrum of roles she was believed, to fulfill, see, *inter alia*, Dominique Iogna-Prat, Eric Palazzo, and Daniel Russo, eds., *Marie. Le culte de la Vierge dans la société médiévale* (Paris: Beauchesne, 1996); and Miri Rubin, *Mother of God: A History of the Virgin Mary* (London: Allen Lane, 2009).

85. Contrast the plethora of overtly Marian material in MS W082 with the range typically found in *horae*, conveniently summarized



Figure 18. *A morning levée, prayer to Christ, fol. 175r, Coëtivy Hours, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).*

those produced for affluent clients, could harness spiritual instruments and even theological concepts to craft a devotional aid and *vade mecum* that was intensely personal.

Given the demanding requirement of providing so many depictions of Mary, it is interesting that at least four types of Marian scene current in northern French illumination during the first half of the fifteenth century do not appear in the Coëtivy Hours, namely her marriage, her dormition, her assumption, and the Madonna of Mercy. Though not commonplace in *horae*, these scenes are not unwitnessed in such books, and relevant iconographies were certainly current in the circle of the Bedford and Dunois Masters.⁸⁶ Nor,

in Virginia Reinburg, *French Books of Hours: Making an Archive of Prayer, c. 1400–1600* (Cambridge: Cambridge University Press, 2012), 209–24.

86. A few examples will suffice for each. Marriage: *Très Belles Heures of Jean de Berry* (Paris, Bibliothèque nationale de France, MS n.a.l. 3093), p. 2 (Millard Meiss, *French Painting in the Time of Jean de Berry: The Late Fourteenth Century and the Patronage of the Duke*, 2 vols. [London: Phaidon, 1967], 2: ill. 6); New York,



Figure 19. Deathbed with attendant Virgin, prayer to the Blessed Virgin Mary (Appendix I, no. 23), fol. 235r, Coëtivy Hours, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).



Figure 20. Deathbed, Virgin receiving the soul into heaven, prayer to the Blessed Virgin Mary (Appendix I, no. 17), fol. 226v, Coëtivy Hours, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

Morgan Library, M 453 (John Plummer, *The Last Flowering: French Painting in Manuscripts, 1420–1530* [New York: Oxford University Press, 1982], no. 11 [this scene reproduced]); Baltimore, Walters Art Museum, W 281 (ibid., no. 12, this scene reproduced); also in the borders of the Annunciation in the Bedford Hours (London, British Library, MS Add. 18850, fol. 32v: König, *Bedford Hours*, 41) and its two sister copies, Lisbon, Museu Calouste Gulbenkian, MS LA 237, fol. 25v (ibid., 45) and Vienna, Österreichische Nationalbibliothek, MS 1855, fol. 25v (ibid., 46; Hermann Julius Hermann, *Die westeuropäischen Handschriften und Inkunabeln der Gotik und der Renaissance mit Ausnahme der niederländischen Handschriften* 3. *Französische und iberische Handschriften der ersten Hälfte des XV. Jahrhunderts*. Beschreibendes Verzeichnis der illuminierten Handschriften in Österreich, neue folge 7, Teil 7 [Leipzig: Hiersemann 1938], no. 19, pl. XLV). Dormition and Assumption: Paris, Bibliothèque nationale de France, MS n.a.l. 3093, p. 78 (Meiss, *French Painting*, 2: ill. 13); Vienna, Österreichische Nationalbibliothek MS 1855, fol. 87v (Hermann, *Westeuropäischen Handschriften*, pl. XLIX); Windsor, Windsor Castle, Royal Library, “Sobiesky Hours,” fols. 73v and 104v (Eleanor P. Spencer, *The Sobiesky Hours: A Manuscript in the Royal Library at Windsor Castle*, The Roxburghe Club 240 [London: Academic Press, 1977], pls. XXXVII and XLI); the Châteauroux Breviary (Châteauroux, Bibliothèque municipale, MS 2),

while it has a lamentation, does the Coëtivy Hours feature a Pietà (*Vesperbild*) as such.⁸⁷ The images selected for the Coëtivy Hours thus explore Mary’s miraculous background and personal piety, her association with the *hortus conclusus* and thereby with purity and Paradise, her maternal roles as

fol. 282v (an image painted by the Bedford Master): Villela-Petit, *Bréviaire de Châteauroux*, 85–86 and 88). Madonna of Mercy: Lisbon, Museu Calouste Gulbenkian, MS LA 237, fol. 258v; London, British Library, MS Add. 18850, fol. 150v; Vienna, Österreichische Nationalbibliothek MS 1855, fol. 145v (all by the Bedford atelier); in all three cases it is the highest ranks of church and state who are shown under the Virgin’s cloak. On the introduction of the type into France, see Katherine T. Brown, *Mary of Mercy in Medieval and Renaissance Italian Art: Devotional Image and Civic Emblem* (Abingdon: Routledge, 2017), 157–63.

87. Entombment–Lamentation, fol. 73r; Deposition–Lamentation, fol. 198v. Images of the Pietà itself are prominent in such earlier Parisian *horae* as Baltimore, Walters Art Museum, W100 (Use of Paris, beginning of the fifteenth century), fol. 34r; and London, British Library, MS Add. 29433 (Use of Paris, beginning of the fifteenth century) fol. 174r: Meiss, *Late Fourteenth Century* 2: ill. 811.

genetrix and *nutrix* of a being who was both human and divine—and in terms of frequency of depiction, this is what predominates—and her potential as a personal intercessor, even savior. However, they ignore her unconsummated human marriage, her cradling her dead son, her passing, and her persona as protector of groups.

More remarkably, although Prigent de Coëtivy is frequently represented in surrogate in the borders of the manuscript via his armorial or mottoes,⁸⁸ none of the Marian images includes an actual depiction of him. That the atelier he employed to decorate his book was adept at supplying representations of high-ranking patrons alongside the Virgin and Child and was doing so around the time his manuscript was being made is demonstrated by the Dunois Hours, a comparison made additionally relevant by the circumstance that its miniatures share many designs and details with the corresponding subjects in the Coëtivy Hours.⁸⁹ The first Marian prayer in the Dunois Hours, *Obsecro te* (an *oraison* that is near-universal in *horae*), is introduced by an illumination of Jean de Dunois, kneeling in supplication beside the Virgin and Child.⁹⁰ This makes all the more striking the absence of a comparable figure of Prigent de Coëtivy from every one of the many images of the Virgin and Child in his book of hours.⁹¹ Closest in design to what was to become the archetypical scene of Virgin, Child, and patron is the image for *O intemerata*, the other near-universal Marian *oraison*;⁹² but instead of the patron, here the figure kneeling beside the holy pair is the Archangel Gabriel complete with a scroll inscribed, “Ave gratia plena dominus tecum” (hail, full of



Figure 21. Coëtivy Hours, fol. 209r; prayer *O intemerata* (Appendix I, no. 6); Virgin and Child with the Angel Gabriel, Coëtivy Hours, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

88. The mottoes repeatedly emblazoned in this book are *Dame sans per* and *Helas belle mercy*.

89. The date of the Dunois Hours and its proximity to that of the Coëtivy Hours are discussed by Reynaud, “Heures du chancelier Guillaume Jouvenel des Ursins,” 34n12; Catherine Reynolds, “The Workshop of the Master of the Duke of Bedford: Definitions and Identities,” in *Patrons, Authors and Workshops: Books and Book Production in Paris around 1400*, ed. Godfried Croenen and Peter Ainsworth, *Synthesa* 4 (Leuven: Peeters, 2006), 437–72, at 466; and Châtelet, “Heures de Dunois,” 15 and 67.

90. London, British Library, MS Yates Thompson 3, fol. 22v (reproduced: Châtelet, “Heures de Dunois,” 3 and 38; Gameson, “Sin and Salvation,” fig. 24.2). Jean de Dunois is also shown on fol. 1r (seated at table in the calendar image for January: Châtelet, “Heures de Dunois,” 28; Gameson, “Sin and Salvation,” fig. 24.1) and on fol. 32v (praying beside an image of the Last Judgment, for the prayer “Deus propitius esto michi”: Châtelet, “Heures de Dunois,” 40–41; Gameson, “Sin and Salvation,” fig. 24.6).

91. His sole appearance is on fol. 141r, praying to God beside St. Michael defeating the Devil for “Deus propitius esto michi”: Unkel, *Miniature Masterpiece*, 47 (ill. 1).

92. Fol. 209r; Appendix I, no. 27: *ibid.*, 22 (ill. 28).

grace, the lord is with you), his salutation to Mary at the Annunciation (Fig. 21).⁹³ Similarly, the image for the commendatory prayer *Sancte Maria mater domini nostri Iesu Christi in manus eiusdem filii tui et in tuas . . . commendo* features, alongside the Virgin and Child, a prie-dieu with an open book, at which one might have expected to find the patron kneeling in prayer, echoing the celebrated Rolin Madonna of Jan Van Eyck;⁹⁴ however, the figure that is actually depicted there is a harp-playing angel (Fig. 14). Another context wherein one might perhaps have anticipated some sort of reference to a patron who had risen to the rank of admiral of France is the miniature for the prayer that begins by saluting Mary as *stella*

93. Luke 1.28. Compare fol. 21r (Fig. 1).

94. Paris, Musée du Louvre, inv. 1271 (MR 705): Micheline Comblen-Sonkes and Philippe Lorentz, *Musée du Louvre, Paris 2*, 2 vols., *Les primitifs flamands 1: Corpus de la peinture des anciens Pays-Bas méridionaux et de la principauté de Liège au quinzième siècle* 17 (Brussels: Centre international d’étude de la peinture médiévale des bassins de l’Escaut et de la Meuse, 1995), 1: no. 175.



Figure 22. *Virgin and Child in hortus conclusus*, *Stella maria maris* (Appendix I, no. 27), fol. 303r, *Coëtivy Hours*, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

maris (star of the sea) (Fig. 22).⁹⁵ Yet no such feature is evident: the illumination shows the Virgin and Child plus a harp-playing angel within a *hortus conclusus* with a generic sweep of water in the background.⁹⁶

A possible key to understanding the quantity of Marian prayers and the wealth yet selectiveness of Marian imagery is the circumstance that the book was made around the time of, or shortly after, Prigent de Coëtivy's marriage (1444) to a woman named Marie, the connection between the event and the *horae* being underlined by the many folios in the manuscript that were adorned with the new arms (quartered with those of his wife's family) that he adopted then.⁹⁷ The mascu-

line forms of some of the prayers confirm that the volume was made for Prigent himself, not for Marie;⁹⁸ however, celebrating his young wife's most prominent name saint, the Virgin Mary, through the inclusion of as many Marian prayers and images as possible would be a logical and appealing gesture. Moreover, in the context of a marriage, with its hope of procreation, the emphasis placed by the imagery on Mary as the ideal mother—there are no fewer than eighteen depictions of the Virgin and Child, in addition to nine scenes showing parts of the Nativity story—also makes perfect sense. Lest it seem implausible that one would commission a book with a range of texts and images of the Virgin as, among other things, a form of homage to one's wife, one need only recall that just a few years after the *Coëtivy Hours* was made, the treasurer of France (Etienne Chevalier) paid for a grand diptych painted by the most talented artist of the day (Jean Fouquet) that showed the Virgin Mary with the distinctive physiognomy, it is believed, of Agnès Sorel, the recently deceased mistress of Charles VII of France, the king whom Etienne and indeed Prigent de Coëtivy served,⁹⁹ and of whose illegitimate daughter from Agnès (Marie Marguerite) Prigent was guardian.¹⁰⁰

There might conceivably be another frame of reference and hence further overtones to the abundance of Marian devotions and imagery in the *Coëtivy Hours*. Although the marriage greatly enhanced Prigent's material prosperity, it may also have brought certain negative connotations: for in adopting the name and arms of the Rais family (as the marriage contract initially obliged him to do),¹⁰¹ he was assimilating himself to conspicuous notoriety. His wife's father, in whose downfall Prigent had been directly involved, was the infamous Gilles de Rais, condemned and then executed at Nantes in October 1440 for murder, sodomy, and heresy, and whose interest in alchemy and the occult was the stuff of legend.¹⁰² In this context, commissioning a book that stressed the exceptional sanctity of the sacred namesake of Prigent's new wife could be seen as a suitable gesture to counterbalance

95. Fol. 303r; Appendix I, no. 27: Unkel, *Miniature Masterpiece*, back cover.

96. Only one other of the Marian images features water in the background: fol. 229v; Appendix I, no. 20.

97. The politics and maneuverings surrounding the alliance are summarized by Georges Bataille, *Le Procès de Gilles de Rais. Les Documents* (Paris: Jean-Jacques Pauvert, 1965), 198–200.

98. E.g., Appendix I, no. 5: "ut sis michi miserrimo peccatori in adiutorem in die exitus mei . . . ut me famulum tuum ab omnibus malis preteritis presentibus et futuris me custodias."

99. Stephan Kemperdick, ed., *Jean Fouquet. Das Diptychon von Melun* (Berlin: Staatliche Museen/Petersberg: Michael Imhof, 2017), esp. 83–97 (Thomas Kren, "Die Madonna von Melun, Agnès Sorel und der Hof Karls VII"); also François Avril, *Jean Fouquet, peintre et enlumineur du XV^e siècle* (Paris: Bibliothèque nationale de France and Hazan, 2003), nos. 7–8.

100. Prigent's younger brother, Olivier, married Marie Marguerite de Valois in 1458.

101. He was subsequently released from this condition: Bataille, *Procès*, 199.

102. Gilles' "confessions" on these and other points are printed in Bataille, *Procès*, 266–83.

any unfortunate associations adhering to the Rais name, lands, and fortune.

Be that as it may, the Coëtivy Hours stands as a remarkable monument to the Marian devotion—one might even say to the Mariology—of one high-ranking layman in France in the middle of the fifteenth century. Its plethora of Marian prayers and images constitutes a repertory of the ways in which the Mother of God was understood and of the powers with which she was most readily credited by well-to-do, well-educated secular society, reiterating with a rare persistence the succoring, restorative, and salvific roles that she was believed to fulfil. Correspondingly, the book sets out in singular detail the *raison d'être* of *horae* as a genre, namely the centrality to lay piety of Mary as role model, intercessor, and *de facto salvatrix*.

Color in the Coëtivy Hours

In February 2019 selected folios of the Coëtivy Hours were studied by Raman spectroscopy, diffuse reflectance spectroscopy (also known as fiber optic reflectance spectroscopy: FORS), and multispectral imaging (recording the page under light of different wavelengths from the ultraviolet to the near-infrared).¹⁰³ What, then, did this contribute to knowledge of the manuscript?

Imaging at the infrared (IR) end of the spectrum rendered visible the carbon-based drawings that underlie the miniatures. What is immediately striking about some of the underdrawings thus revealed is how extremely elaborate they are: the carbon lines do not simply adumbrate the principal elements of the designs, they provide fully worked-up versions of them, complete with countless minor details, not to mention hatching to effect shading. The point may be illustrated by comparing the wings of the cherubim that comprise God's aureole in the image of the Annunciation with the lines that underlie them.¹⁰⁴ Manifold elements of the delicate wing structures were carefully rendered in carbon—only to be partially obliterated when, in due course, paint was applied on top (Fig. 23; compare Fig. 1). The underdrawing for the face of the Virgin Mary in the miniature of her Coronation presents an even higher level of finish: not only is the design comprehensively delineated by the drawing (including the many strands of wavy hair and every element of the facial features), but much of its shading and hence to some extent the volumes and even the tonalities of the finished painting are also defined by the carbon lines (Fig. 24; compare Fig. 2).¹⁰⁵ This reveals how far the finest miniatures in the book rely for their

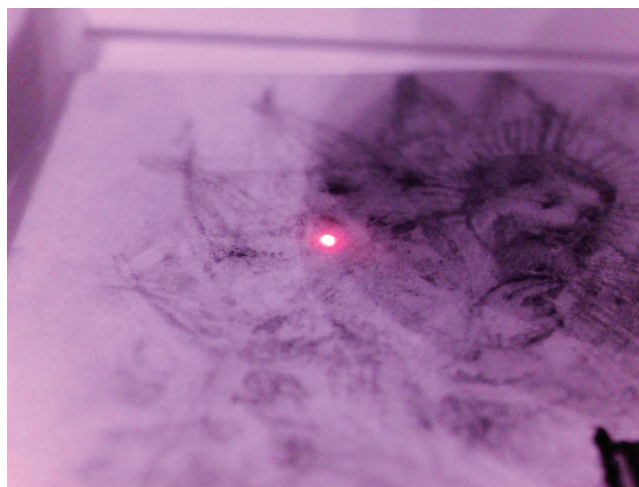


Figure 23. Infrared image, fol. 21r (detail), Coëtivy Hours, Dublin, Chester Beatty Library, MS W082 (photo: Team Pigment).

final effect on the underdrawings. In extent, delicacy, and use of hatching (though not in medium and style), they bear comparison with such celebrated fifteenth-century northern European drawings as the ink rendering of Jerome that was prefixed to the *Bible moralisée* commissioned by Philip the Bold of Burgundy,¹⁰⁶ and the sequence of processions added in silver point below the litany in a Parisian book of hours completed in 1408.¹⁰⁷ In the Coëtivy Hours, the use of myriad lines to provide complicated details and subtle shading, which were then gently muted by the application of thin washes of color, imparts to the finished appearance a “soft focus” effect that is typical of the best work associated with the Dunois Master.

106. Paris, Bibliothèque nationale de France, fr. 166: John Lowden, *The Making of the Bibles Moralises*, 2 vols. (University Park: Penn State University Press, 2000), 1:251–84 (the frontispiece discussed on 276–79 and illustrated as pl. XXVI).

107. Oxford, Bodleian Library, MS Douce 144, fols. 105r, 108v–109r, 110r; a note on fol. 27r records that the book “factum et completum est anno m^occcc^ovij^o quo ceciderunt pontes par[isiensis / isiensis]”: Hofmann, “Haincelin de Haguenau,” 99–101 and 106–7 (ascribing these drawing to ca. 1415); Elisabeth Taburet-Delahaye, ed., *Paris 1400: Les Arts sous Charles VI* (Paris: Fayard, 2004), no. 185 (ascribing them to ca. 1420). Study of drawing techniques in fifteenth-century French manuscripts has recently been invigorated by the appearance of the so-called Drawn Van Limborch Hours: Eberhard König, *Das Genie der Zeichnung. Ein unbekanntes Manuskript mit 30 grossen Darstellungen von einem Bräuer Limburg*, *Illuminationen* (Rotthalmünster) 23 (Ramsen: Heribert Tenschert, 2016); Christine Seidel, “Images in Pen and Ink: Technical Remarks on the Drawn Van Limborch Hours,” in *Maelwael Van Limborch Studies* 1, ed. André Stufkens and Clemens Verhoeven (Turnhout: Brepols, 2018), 98–111.

103. See Appendix II for technical specifications.

104. Fol. 2r: Unkel, *Miniature Masterpiece*, 29 (ill. 40).

105. Fol. 69v: *ibid.*, 59.



Figure 24. Infrared image, fol. 69v (detail), *Coëtivy Hours*, Dublin, Chester Beatty Library, MS W082 (photo: Team Pigment).

The underdrawing for the illumination on fol. 101r of the *Coëtivy Hours* (a funeral procession), by contrast, is altogether simpler: the main elements of the composition are mapped out, but there is far less linear detail than in the cases just considered. Here the final effect is more dependent on the paint that was applied, and the finished result is less refined (Fig. 25; compare Fig. 26). The images that make up the unusually lengthy pictorial cycle for the Office of the Dead are all at the least delicate, least elaborate end of the spectrum of styles that occur in the *Coëtivy Hours*.¹⁰⁸ What the evidence of IR imaging reveals is that the differences here are not simply a matter of a heavier manner of painting: rather, they involve divergences of approach and technique that begin at the earliest stages of work. The underdrawing in these cases is simpler, the application of paint thicker, and the relationship between drawing and painting is different from what was observed in the images of the Annunciation and the Coronation of the Virgin discussed above. There, the drawing was an essential part of the finished result; here, it is a preliminary stage—a guide to elements of the composition that would only be fully defined with paint. With such fundamental differences of approach, realization, and finish, there can be little doubt that a different hand was at work here.¹⁰⁹ The *Coëtivy Hours* can thus be set alongside

108. Fols. 88r, 93r, 96r, 101r, 106r (Unkel, *Miniature Masterpiece*, 20 [ill. 25]), and 108r (ibid., 31 [ill. 42]).

109. The underdrawing by the Bedford Master for the frontispiece of the Missal of Louis de Guyenne—which, as the process of adding paint to the page did not progress very far, remains exposed—displays an approach much closer to the former manner than to the latter: every detail is carefully delineated, with some contour lines heavier than others, thereby adding contrast and

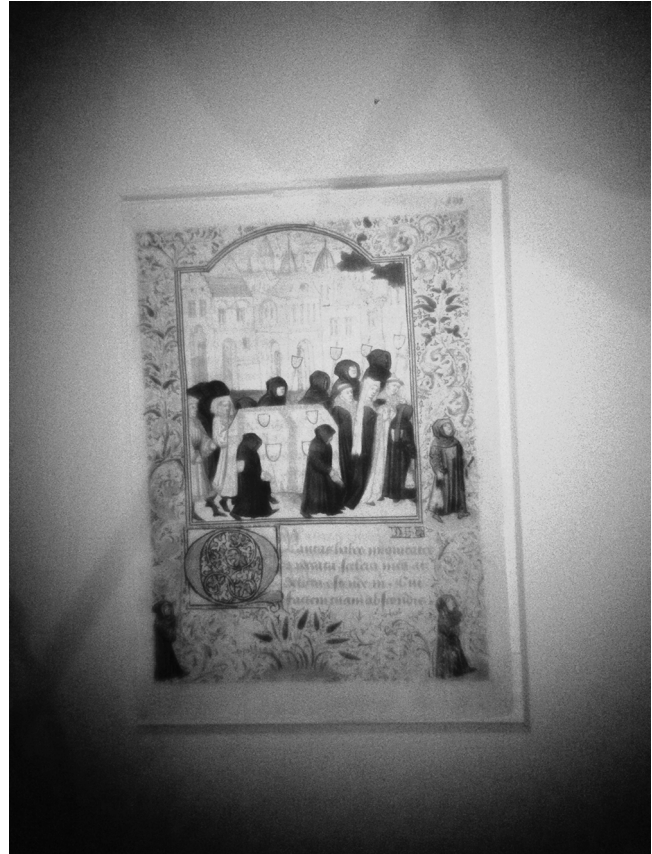


Figure 25. Infrared image, fol. 101r, *Coëtivy Hours*, Dublin, Chester Beatty Library, MS W082 (photo: Team Pigment).

such other high-grade *horae* as the *Belles Heures* of Jean de Berry and the *Hours* of Isabella Stuart, whose underdrawings, newly revealed by IR imaging, are manifestly the work of several hands with contrasting approaches to draftmanship and its roles.¹¹⁰

mass, though there is no hatching for subtler shading (Paris, Bibliothèque Mazarine, MS 406, fol. 7r: Taburet-Delahaye, ed., *Paris 1400*, no. 70 with color plate on p. 145).

110. Margaret Lawson, "Technical Observations: Materials, Techniques, and Conservation of the *Belles Heures* Manuscript," in *The Art of Illumination: The Limbourg Brothers and the Belles Heures of Jean de France, Duc de Berry*, ed. Timothy Husband (New York: Metropolitan Museum of Art/New Haven: Yale University Press, 2008), 325–41, esp. 330–33; Stella Panayotova, "The Rohan Masters: Collaboration and Experimentation in the *Hours* of Isabella Stuart," in *Manuscripta Illuminata: Approaches to Understanding Medieval and Renaissance Manuscripts*, ed. Colum Hourihane, Index of Christian Art Occasional Papers 16 (Princeton: Index of Christian Art/University Park: Penn State University Press, 2014), 14–46. For an overview of the findings from an ambitious program of such examination applied to Netherlandish manuscripts, see Micha Leeflang and Margareet Wolters, "Underdrawing in Miniature. Examining Manuscripts from the Southern Netherlands with Infrared



Figure 26. A funeral procession, Vigil for the Dead, lection IV, fol. 101r, Coëtivy Hours, Dublin, Chester Beatty Library, MS W082 (photo: © Trustees of the Chester Beatty Library).

The pigments that were used in the Coëtivy Hours, identified by Raman spectroscopy and diffuse reflectance spectroscopy, may be summarized as follows (a more detailed listing of exactly what was identified on which folios is presented in Appendix II).

Red: vermillion; minium; organic.

Pink: organic.

Orange: mosaic gold.

Yellow: lead-tin yellow (Type I); ochre; organic.

Brown: ochre (with or without vermillion shading).

Green: copper-based; a vergaut of indigo and lead-tin yellow.

Blue: lapis lazuli of various grades; indigo.

Purple: organic.

Black: carbon.

Gray: carbon.

Reflectography," in *Splendour of the Burgundian Netherlands*, ed. As-Vijvers and Korteweg, 20–31, including discussion of distinguishing different hands at work in one book (29–30).

White: white lead.

Gold: gold leaf; powdered ("shell") gold/gold ink.

Silver: silver.

Relatively few fifteenth-century French books have had their pigments studied scientifically, and the majority of those that have been so examined date from the beginning or the end of that period.¹¹¹ The findings from the Coëtivy Hours thus provide a useful complement from the middle of the century. One distinctive aspect of pigment use here was a direct result of a particular aesthetic choice: the decision to present many of the main figures in white robes—so-called *demi-grisaille*—inevitably led to more extensive use of white lead than in non-grisaille work (be it of other artists or indeed of the Dunois workshop itself).¹¹² And notwithstanding the quantity of white that was accordingly needed, white lead was the only form that appears to have been used (we did not observe any occurrence of chalk white, which has occasionally been reported in fifteenth-century French books).¹¹³

111. Bernard Guineau and Inès Villela-Petit, "Couleurs et technique picturale du Maître de Boucicaut," *Revue de l'art* 135 (2002): 23–42; Villela-Petit, *Le Bréviaire de Châteauroux*, 119–35; Inès Villela-Petit and Bernard Guineau, "Le Maître de Boucicaut revisité: Palette et technique d'un enlumineur parisien au début du XV^e siècle," *Art de l'enluminure* 6 (2003): 2–33; Margaret Lawson, "Belles Heures of Jean, Duc de Berry: The Materials and Techniques of the Limbourg Brothers," in *The Limbourg Brothers: Nijmegen Masters at the French Court, 1400–1416*, ed. Rob Dückers and Pieter Roelofs (Ghent: Ludion, 2005), 148–63; Nancy Turner, "The Manuscript Painting Techniques of Jean Bourdichon," in *A Masterpiece Reconstructed: The Hours of Louis XII*, ed. Thomas Kren and Mark Evans (Los Angeles: The J. Paul Getty Museum/London: British Library, 2005), 63–79; Inès Villela-Petit, "Palettes comparées: Quelques réflexions sur les pigments employés par les enlumineurs parisiens au début du XV^e siècle," in *Quand la peinture était dans les livres*, ed. Hofmann, König, and Zöhl, 383–91; Panayotova, "Rohan Masters"; Stella Panayotova, ed., *Colour: The Art and Science of Illuminated Manuscripts* (Turnhout: Harvey Miller, 2016), passim.

112. Other *horae* illuminated by the Dunois atelier in *demi-grisaille* are those of Guillaume Jouvenal des Ursins (Paris, Bibliothèque nationale de France, MS n.a.l. 3226); of Simon de Varie (Los Angeles, J. Paul Getty Museum, MS 7 + The Hague, Koninklijke Bibliotheek, MS 74 G 37 + 37a); and the dismembered copies represented by London, Victoria & Albert Museum, MSS E4582–1910, E4583–1910 + Paris, Musée Marmottan, MS Wildenstein 149 + other *membra disjecta*, and by London, Victoria & Albert Museum, MSS E4580–1910 and E4581–1910.

113. E.g., in the work of the Boucicaut Master: Guineau and Villela-Petit, "Couleurs et technique picturale," 34. The general currency of calcium white is indicated by its presence among the pigments documented in the accounts of the dukes of Burgundy (destined for large-scale projects rather than illumination): Susie Nash, "Pour couleurs et autres choses prise de lui . . .": The Supply, Acquisition, Cost and Employment of Painters' Materials at the

Correspondingly, the minimal use made of silver in this manuscript should probably be seen in relation to the fact that the aesthetic effect of this metal would have been compromised in contexts dominated by the whites and grays of *demi-grisaille*, whereas within more saturated, generally brighter palettes, it could be deployed (albeit sparingly) to greater effect, as the Boucicaut Master in particular seems to have appreciated.¹¹⁴ Although these choices were surely made for aesthetic rather than economic reasons, the elimination of one of the costliest materials and the liberal use of one of the cheapest (white lead) will still have implied a very modest reduction in the overheads for the project.¹¹⁵

Comparing the range of color stuffs identified in the Coëtivy Hours with those of other fifteenth-century French illuminations that have been studied scientifically reveals many shared usages, as one would expect. Thus, the pigments employed for reds, pinks, purples, browns, blacks, grays, and whites in the Coëtivy Hours correspond to those prevalent in most other manuscripts for which data are available. An area where the Coëtivy illuminators followed a common but by no means universal contemporary preference was in their use of lapis lazuli and indigo for blues, but not of azurite: for the first two pigments are almost ubiquitous in the fifteenth-century French manuscripts that have been examined, while azurite appears alongside them in less than half of the known sample.¹¹⁶ A similar observation can be made for yellow; while the primary pigment used in the Coëtivy Hours (lead-tin yellow) was that which was most widely deployed elsewhere, the range of secondary color stuffs (ochre and organic, but not orpiment) appears to reflect personal choice for this project.¹¹⁷

It is currently impossible to diagnose with absolute certainty the nature of the copper greens in the Coëtivy Hours;¹¹⁸

however, the data collected suggest verdigris rather than malachite. Whether this would represent typical or atypical practice is difficult to say: because of the challenges involved in distinguishing the mineral green by noninvasive technologies, the precise extent to which it was used even in such fifteenth-century French manuscripts as have been investigated scientifically is currently unclear.¹¹⁹ (The absence of malachite from the extensive listings of pigments that appear in the Burgundian ducal accounts implies that it was not in general use for other artistic projects.¹²⁰) Where divergence between the usages in the Coëtivy Hours and those of the other books is unquestionably apparent is in the choice of mosaic gold for orange, a color that most other fifteenth-century French illuminators rendered via minium (red lead).¹²¹

A similar picture of broad correspondence plus a measure of idiosyncrasy is apparent if one compares the palette of the Coëtivy Hours with the range of materials favored in broadly contemporary recipe books. There is general agreement not only in terms of the principal colorants used but also with regard to details of their preparation: thus the attention paid in recipe collections to methods for extracting different qualities of blue from lapis lazuli corresponds to the observable deployment in the Coëtivy Hours of pigments made from

that of the excitation source. Due to the broad absorption profile of copper green pigments, a 633 nm laser is ineffective for extracting a Raman signal. Use of another excitation source could yield information; however, the expense of developing such equipment in a form suitable for taking to libraries is, at present, prohibitive. Visible FORS does not easily distinguish between these two pigments; moreover, in the present case, the band positions are also affected by the overpainting in indigo + lead-tin yellow. NIR FORS does, in principle, allow one to distinguish between verdigris and malachite (see Paola Ricciardi, Anuradha Pallipurath, and Kristine Rose, "It's Not Easy Being Green": A Spectroscopic Study of Green Pigments Used in Illuminated Manuscripts," *Analytical Methods* 5, no. 16 [2013]: 3819–24); however, the small shifts in the relevant peaks are not always easily resolved from the background signal from the parchment.

119. Villela-Petit, "Palettes comparées," 387–88, reports copper greens in five of her eight books, observing that they are "en général l'acétate de cuivre ou vert-de-gris, et quelquefois un oléate de cuivre ou de la malachite." Ricciardi, Pallipurath, and Rose, "Green," 3823, report French illuminators using malachite from the fifteenth century onward. Specific cases in which the mineral has been identified include a luxurious book of hours made at Angers ca. 1431 (the Hours of Isabella Stuart, Cambridge, Fitzwilliam Museum, MS 62; Ricciardi, Pallipurath, and Rose, "Green," 3822–23; Panayotova, "Rohan Master," 27 and 34; Panayotova, ed., *Colour*, no. 30), and then the work of Jean Bourdichon, active at Tours from ca. 1480 (Turner, "Painting Techniques," 65–66).

120. Nash, "Burgundian Court," 148–51.

121. There was no orange as such on the pages of Manchester, JRUL, MS lat. 164 that we examined; nor did these pages include any minium used for, or in, reds.

Burgundian Court," in *Trade in Artists' Materials: Markets and Commerce in Europe to 1700*, ed. Jo Kirby, Susie Nash, and Joanna Cannon (London: Archetype, 2010), 97–182, esp. Tables 1 and 15.

114. Guineau and Villela-Petit, "Couleurs et technique picturale," 34 and 36; Villela-Petit and Guineau, "Maître de Boucicaut revisité," 13–14. See also Villela-Petit, *Bréviaire de Châteauroux*, 126–27.

115. Prices of these (and other) painters' materials may be conveniently compared in Nash, "Burgundian Court," Tables 15 and 26; and Lorne Campbell, "Suppliers of Artists' Materials to the Burgundian Court," in *Trade in Artists' Materials*, ed. Kirby et al., 183–88, at 183–85.

116. In Manchester, John Rylands University Library, MS lat. 164, another book of hours associated with the Dunois Master, azurite was used—alongside lapis lazuli—in the borders, but lapis and indigo were, again, the only blues in the miniatures (analysis by the present writers).

117. The principal yellow used in Manchester, JRUL, MS lat. 164 (see previous note), by contrast, was ochre.

118. Identification via Raman spectroscopy relies upon the compound not absorbing the inelastically scattered photons along with

different grades of that mineral.¹²² To focus specifically on points of contrast: recipes known to have been recorded in Paris between 1398 and 1431 include prescriptions for massicot and orpiment (the latter recommended as a component of vergaut greens), pigments that are not found in the Coëtivy Hours;¹²³ but they do not include lead-tin yellow, a color stuff that was certainly present in our book.¹²⁴ Concerning organic colorants (which are not definitively identifiable via our wholly noninvasive investigative techniques),¹²⁵ the Parisian recipes feature blue from cornflower, yellow from saffron—recommended as an intensifier or glaze for other pigments—and, above all, pink and red from brazilwood (*Caesalpinia sappan* Linn.).¹²⁶ Brazilwood and unspec-

ified red lake pigments also figure regularly in the accounts for artists' materials (albeit primarily for large-format works rather than illumination) associated with the Burgundian court.¹²⁷

Returning to the corpus of pigments that have been identified scientifically, we see that, overall, the range of materials found in the Coëtivy Hours conforms to another norm observable in the fifteenth-century sample as a whole—namely that not all the color stuffs that were readily available to contemporary illuminators were actually deployed.¹²⁸ In point of fact, this is a phenomenon that extends well beyond fifteenth-century France. In certain circumstances, selectivity in this regard can be linked to such factors as the artistic background and personal preferences of the illuminator, or to the hierarchy of tasks and personnel within a particular atelier, as well as to cost.¹²⁹ Since cost was clearly not an issue in the production of the Coëtivy Hours, since none of the pigments that were shunned would have been difficult to obtain in Paris in the 1440s, and since the Dunois Master favored a slightly different, even more restricted range of materials for painting the broadly contemporary and comparably luxurious manuscript Manchester JRUL lat. 164,¹³⁰ it seems reasonable to presume that it was primarily artistic preference that guided the selection of colorants for our manuscript.

Let us now consider the painting techniques observable in the Coëtivy Hours. As in other broadly contemporary books, so too in this manuscript, hues of differing intensities were generated from the chosen color stuffs by varying the quantity of pigment in the paint. The blues of the sky and water that are so common a feature of the backgrounds in the Coëtivy Hours, for example, are all of lapis lazuli, their tonal modulations being achieved by the use of different grades of

122. With increased grinding and processing, more of the sulfur chromophores trapped in the crystalline matrix of the material are released and the color of the lapis lazuli is reduced—with a corresponding reduction in the peaks observed in the Raman spectrum. See further Catherine Schmidt, Marc Walton, and Karen Trentelman, "Characterization of Lapis Lazuli Pigments Using a Multitechnique Analytical Approach: Implications for Identification and Geological Provenancing," *Analytical Chemistry* 81, no. 20 (2009): 8513–18.

123. Nor in Manchester, JRUL, MS lat. 164. Both are documented among the pigments acquired by the Burgundian court in the late fourteenth and early fifteenth centuries: Nash, "Burgundian Court," 151–53.

124. Recipes from Jacobus Cona (Jacques Coene) and from Antonius de Compendio (Antoine de Compiègne) recorded in 1398 by Johannes Archerius; recipes collected by Johannes le Begue and written down in 1431: printed in *Original Treatises Dating from the XIIIth to XVIIIth Centuries on the Arts of Painting*, ed. Mary Philadelphia Merrifield, 2 vols. (London: John Murray, 1849), 1:259–79, 281–88, and 290–318 respectively. For more on the complicated, composite collection in question (Paris, BnF, MS lat. 6741), see Richard H. Rouse and Mary A. Rouse, *Manuscripts and Their Makers: Commercial Book Producers in Medieval Paris, 1200–1500*, 2 vols. (Turnhout: Harvey Miller, 2000), 2: Appendix 11A (211–16 with 237–39); and Panayotova, ed., *Colour*, no. 21. For comparisons between these recipes and contemporary practices more generally, see Nancy Turner, "The Recipe Collection of Johannes Alcherius and the Painting Materials used in Manuscript Illumination in France and Northern Italy, c. 1380–1420," in *Painting Techniques: History, Materials, and Studio Practice: Contributions to the Dublin Congress*, ed. Ashok Roy and Perry Smith (London: International Institute for Conservation of Historic and Artistic Works, 1998), 45–50.

125. The strong fluorescence of small organic molecules used as chromophores often swamps their Raman signal. The small shifts of FORS spectra in the visible range, difficult to differentiate without processing, are readily observed only in relation to pure pigments (as opposed to the mixtures that abound in the Coëtivy Hours).

126. For further discussion of brazilwood red in late-medieval recipe collections, see, e.g., Arie Wallert, "Verzino and Roseta Colours in 15th Century Italian Manuscripts," *Maltechnik-Restauro* 92 (1986): 52–70; Wallert, "Instructions for Manuscript Illumination in a 15th Century Netherlandish Technical Treatise," in *Masters and Miniatures: Proceedings of the Congress on Medieval Manu-*

script Illumination in the Northern Netherlands (Utrecht, 10–13 December 1989), ed. Koert van der Horst and Johann-Christian Klamt (Doornspijk: Davaco, 1991), 447–56, esp. 449–50; and *The Strasbourg Manuscript: A Medieval Tradition of Artists' Recipe Collections (1400–1570)*, ed. Sylvie Neven (London: Archetype, 2016), recipes 10 and 30 (82–83 and 100–101, with commentary on 165–67).

127. Nash, "Burgundian Court," 141–43.

128. Villela-Petit, "Palettes comparées," 387–88.

129. For relevant cases from thirteenth- through fifteenth-century England and Italy, see Andrew Beeby, Richard Gameson, and Catherine Nicholson, "Illuminators' Pigments in Lancastrian England," *Manuscripta* 60, no. 2 (2016): 143–64; and Richard Gameson and Giorgia Marucci, "The Colour of the Law," *Codices Manuscripti & Impressi* 112–13 (2018): 13–45.

130. Red: vermillion and organic. Yellow: ochre. Green: copper-based. Blue: lapis lazuli and indigo in the miniatures, azurite and lapis in the borders. Pinks and purples: organic (with and without vermillion). White: lead. Black: carbon. Gold: shell gold and mosaic gold.

the mineral or by altering the amount of it in the paint: a highly dilute wash was employed for general coverage, while formulations containing more colorant were applied for the richer tones of the upper heavens and for the darker zones within wave formations. Further detail was then added in white and gold to evoke clouds or spume, as needed. The different intensities of browns that were used for buildings—lighter for exteriors, darker for interiors, with yet deeper hues used to delineate architectural detail—were created in similar ways. Other colors used for stone and masonry (principally gray or light pink) were varied via the admixture of more or less lead white as required.

Tonalities or gradations of greater subtlety relied on more complex procedures.¹³¹ For the wings of the cherubim, for instance, a light glaze of organic red was applied for general coloring; then a denser, more opaque red (comprising the same organic substance enriched with vermillion) was deployed to firm up the main contours and to add internal lines evoking feather forms. Skin tones were built up with thin layers of white lead glaze washed over delicate drawings in carbon whose hatchings provided form and shading, with further subtleties being added on top in brown, pink, and/or white, plus touches of red to articulate cheeks and lips.¹³² The finest of the white robes that so many of the figures wear were similarly created by meticulous, shaded underdrawings, one or more layers of white lead, further selective shading in grays and browns, and highlights in thicker, more opaque white lead and, perhaps, gold.

From time to time, certain contours were strengthened with lines of carbon black. Although a feature of numerous other works by the Dunois Master (as indeed of many other illuminators),¹³³ the employment of this technique in the Coëtivy Hours is more equivocal than is apparent at first sight. Carbon black lines are used throughout (as in countless other manuscripts) to outline the line-fillers, the major

initials, and the armorial shields, and to frame the principal miniatures; the loss of gold leaf from many abutting zones has rendered such lines more prominent than was originally the case, but they were always relatively heavy and lacking in finesse. In addition, dark carbon-based lines were applied to certain areas within most of the miniatures. Here they alter the aesthetic of the areas in question, sometimes dramatically: by adding a harsh black edge to details that were originally rendered in gentle modeling with soft contours, they transform a delicate, painterly “soft-focus” effect into a more definite, linear one. Tellingly, the miniatures in the book that have been most admired by previous commentators are those which have been least subjected to this treatment.¹³⁴ Readily visible to the naked eye but not always instantly noticable amidst the richly detailed miniatures, these lines are usefully highlighted by IR imaging.

It is clear from the stratigraphic position of these carbon lines relative to the other components within the miniatures that they were among the final touches to be added. Equally, it is evident from other works of the Dunois atelier that discreet black lines were an integral, albeit intermittent, element of the house style, strategically inserted to outline haloes and to strengthen the occasional contour. What is striking about their application in the Coëtivy Hours, in contrast to the way they were used in most other manuscripts associated with the atelier, is how much harsher, more prominent, and less well controlled they are here than was generally the case.¹³⁵ Any number of imponderable factors could account for this; however, three possibilities in particular are worth considering. First, it is conceivable that this strengthening of outlines was accomplished in haste (perhaps because the deadline for delivery was pressing). Second, the work might have been undertaken by the artist(s) responsible for the Office of the Dead whose style was, as noted above, simpler and bolder than that of the hands responsible for other parts of the book. Third, given that the black ink in question is identical in composition to that of the lines around the armorial shields, which we know to have been repainted when the manuscript passed to Prigent’s brother, Cardinal Alain, it is possible that at least some of these obtrusive contour lines were added or strengthened as part of the same program of reconditioning. If perchance this was the case, then the work undertaken at Cardinal Alain’s behest extended to making modest aesthetic, as well as heraldic, changes. In the absence of further evidence, however, there is no way of deciding between these (and other) hypotheses.

131. The *Liber de coloribus illuminatorum*, of presumed French origin, known from a late fourteenth-century copy, presents a series of prescriptions for what might best be used to lighten and darken a series of individual colors: Daniel Varney Thompson, “*Liber de coloribus illuminatorum sive pictorum* from Sloane MS. No. 1754,” *Speculum* 1, no. 3 (1926): 280–307.

132. For an overview of the different approaches taken by illuminators across the centuries to the challenge of rendering human flesh, see Nancy Turner, “‘Incarnation’ Illuminated. Painting the Flesh in Medieval and Renaissance Manuscripts,” in *Colour*, ed. Panayotova, 271–303.

133. In the only other work associated with the Dunois Master that we have examined scientifically—Manchester, JRUL, MS lat. 164 and a detached miniature that is currently the property of Sam Fogg Ltd., London—such lines were again a carbon black but delicately done.

134. James et al., *Catalogue*, 247; Byrne, “Hours of the Admiral,” 252 and 254–56.

135. Contrast their more delicate nature in, e.g., the Dunois Hours itself and Cambridge, Fitzwilliam Museum, MS McClean 81.

Conclusion

In bringing to light a wealth of additional information about the nature of the materials and techniques that the illuminators used, scientific examination of medieval manuscripts adds myriad new facts to the sum of knowledge about the books in question. At the same time, such findings themselves invariably raise new questions, not least about the organization of illuminators' workshops. The miniatures in the Coëtivy Hours manifest many different gradations of artistic finesse. If the outer extremes are clearly distinguishable one from the other—the Annunciation at the upper end (Fig. 1), the Office of the Dead at the lower (Fig. 26)—the intermediate stages present a sliding scale of artistic achievement that is difficult to subdivide and classify. Moreover, there is more to this subtle gradation than meets the eye, since the underdrawings also vary, and not only in complexity and skill but also in the way in which they contribute to the finished result. Future assessments of the Coëtivy Hours and similar books, particularly the sort of connoisseurship that endeavors to assign miniatures to particular hands, need to take into account the technical complexity of the paintings in question, the different stages that were involved in their production, and the extent to which the interaction between these different stages determines the final effect. Evaluations that do not consider the underdrawings—be they of carbon, as here, or of hard point¹³⁶—are literally as well as metaphorically without appropriate foundation.¹³⁷ A comprehensive examination of the underdrawings in the Coëtivy Hours and the various ways in which they contribute to the finished miniatures is likely to reinforce the impression that the vol-

ume was the product of a busy team, whose members could collaborate in diverse ways. No single model of procedure—be it some miniatures wholly realized by one hand and others entirely by another, or one master practitioner drawing designs for the miniatures which either he or others then painted, or even the most skillful hand taking responsibility for the most important areas of a scene with lesser talents accomplishing the rest—is adequate to account for everything in the Coëtivy Hours. On the contrary, the distribution of tasks between participants appears more variable and complex, embracing all of these approaches and probably others too. We noted at the outset that work attributed to the Dunois Master was the product not of an individual but of an extended atelier, or even of a more loosely affiliated collective of book professionals; scientific investigation augments the evidence for such a characterization, underlining its validity.

As the body of reliable data for illuminators' pigments and their use slowly but surely increases, the features observed in individual manuscripts will become easier to contextualize. When we know what is and is not typical of the pigments favored in the Dunois atelier for its other products (which may include panel paintings)¹³⁸—not to mention in mid-fifteenth-century French manuscripts as a whole—various features of the Coëtivy Hours will doubtless become easier to evaluate. However, as the practical difficulties attendant on the scientific study of manuscripts mean that progress in this regard will be slow, it is well worth publishing the findings from individual examinations as they become available, as we have done here.

In the fullness of time, one may hope to achieve representative knowledge of the range of pigments current in French manuscripts (as indeed in the books of other countries) across the decades, a program, moreover, that must embrace minor works as well as masterpieces. It is from such a data set that telling patterns will emerge, highlighting changes in pigment use (and availability) through time. The enormous increase in factual knowledge that this would represent may, in turn, be hoped to offer new insight into issues—above all the choice of certain colors and coloristic effects for particular works—that are currently evaluated purely on artistic and

136. For examples of the latter, see Hélène Verougstraete and Roger van Schoute, "Le frontispiece des *Chroniques de Hainaut*. Examen en laboratoire," in *Les Chroniques de Hainaut ou les ambitions d'un prince bourguignon*, ed. Pierre Cockshaw and Christiane Van de Bergen-Pantens (Turnhout: Brepols, 2000), 149–56, esp. 150.

137. The importance of underdrawings for evaluating fifteenth-century panel paintings has long been appreciated, with infrared photography used from the 1930s and infrared reflectography from the 1960s. For a specimen of recent work, see Catheline Périer-D'Ieteren, "Le rôle du dessin sous-jacent et de l'ébauche préparatoire au lavis dans la genèse des peintures de l'Agneau Mystique," in *Van Eyck Studies: Papers Presented at the Eighteenth Symposium for the Study of Underdrawing and Technology in Painting, Brussels, 19–21 September 2012*, ed. Christina Currie, Bart Fransen, Valentine Henderiks, Cyriel Stroo, and Dominique Vanwijnsberghe (Leuven: Peeters, 2017), 121–35; and Rachel Billinge, "Remarks on Character and Functions in Jan van Eyck's Underdrawing of Portraits: The Case of Margaret van Eyck, Part 1," and Till-Holger Borchert, "Jan van Eyck's Underdrawing of Portraits, Part 2," in *ibid.*, 233–56.

138. A Trinity with the canons of Notre-Dame de Paris, painted on wood (Paris, École nationale supérieure des Beaux-Arts, inv. 1261), and a Last Judgment, formerly on wood, now transferred to canvas (Paris, Musée des arts décoratifs, inv. Pe 1), have been attributed to the workshop: Charles Sterling, *La Peinture médiévale à Paris, 1300–1500*, 2 vols. (Paris: Bibliothèque des arts, 1987–90), 1:457–60; Thiébaud et al., *Primitifs français*, 89, 91, and 174 (nos. 13–14). Unfortunately, neither work is in a good state of preservation, impeding detailed assessment.

aesthetic grounds. For example, awareness that the price of lapis lazuli, always elevated, rose steadily during the course of the fifteenth century provides an informed perspective from which to understand the regular but not immoderate use of ultramarine in the Coëtivy Hours (in contrast to its more lavish presence in earlier manuscripts);¹³⁹ the new knowledge that in the mid-fifteenth century the semiprecious mineral all but vanished from English illuminators' palettes as a pigment in its own right (as opposed to as an additive to azurite) then casts the presence of lapis in, and the absence of azurite from, the Coëtivy Hours in an altogether different and more interesting light.¹⁴⁰ Although it will be some time before the full significance of the palette of the Coëtivy Hours will become evident, the fact that the book's presentation of the Virgin Mary is highly singular is readily apparent now.

Appendix I: Marian Prayers

This repertory of the supplementary Marian prayers and devotions in the Coëtivy Hours (i.e., those extraneous to the offices) supplies for each: folio references; incipit and explicit (nos. 12 and 14, which are short, are given in full); note of its occurrence or otherwise in Leroquais, *Livres d'heures*; and reference to another secondary source, where applicable. The transcriptions follow the capitalization, orthography, and punctuation of the originals, in so far as is feasible with modern equivalents; standard abbreviations are silently expanded; the occasional ambiguous or uncertain form is represented by '-?-' ; italics are used to represent rubric (which in the manuscript may be red or blue).

1. Fols. 193r–194r. *Oratio deuota de nostra Domina*. Ave Maria gracia plena dominus tecum, martir cum martiribus transgladiata morte sacratissima filii tui domini nostri iesu christi. Ergo te per quinque vulnera filii tui et per contractionem viscerum suorum per nimio dolore vulnere, Et per dolorem quem habuisti quando vidisti eum vulnerari, Et per fontes sanguinis sui et per omnes passionem eius, Et per fontes lacrimarum tuarum, audi et exaudi me et imple desiderium cordis mei, et anima[m] mea[m] et corpus meum amore tuo et passione filii tui et gracia celesti. Sicut anima tua vulnerata erat passione filii tui quando vidisti eum mori, et

per illas sanctas lacrimas quas tu fleuisti, da mihi puras et perfectas lacrimas pro peccatis meis et passionem filii tui. Benedicta tu in mulieribus. Reple me cum benedictione et amore tuo et gratia celesti . . . Cuius contemplacione sine fine frui mereamur. Qui cum patre [etc.] Amen. (Not reported in Leroquais, *Livres d'heures*.)

2. Fols. 194v–198r. *Sequitur oracio de nostra domina*. Domina mea sancta Maria perpetua uirgo virginum mater summe et benignitatis et misericordie per illum qui animam tuam pertransiuit gladio doloris dum unigenitus filius tuus dominus noster iesus christus supplicium mortis pateretur in cruce et per illum filialem affectum quo ipse materno dolore compassus integerrime dilectionis sue vicario suo te providendam commendauit. Condole compatere console queso anxietati tribulationi aduersitati et qualicumque necessitati mee miseratrix miserorum dulcis consolacio afflictorum ac mater misericordiarum, desolatorum piissima consolatrix et in omni neccessitate pupillorum prompta adiutrix, Exaudi preces meas et respice orbitatis mee et mee miserie lacrimas quia in diuersis malis et angustiis propter peccata mea positus [sum] penitus ignoro ad quem fugiam nisi ad te dilectissimam dominam meam virginem mariam genitricem domini nostri iesu christi conformem et consimilem et Reformatricem humanitatis nostre . . . et animabus parentum meorum ad omnium fidelium defunctorum requiem eternam et vivis salubram vitam et prosperitatem in hoc seculo concede. (Leroquais, *Livres d'heures* 1:48, 177, and 319. See also André Wilmart, *Auteurs spirituels et textes dévots du moyen âge latin. Études d'histoire littéraire* [Paris: Bloud & Gay, 1932], 516n1, nos. 5 and 6.)

3. Fols. 198v–201r. [No rubric.] Obsecro te domina sancta Maria mater dei pietate plenissima summi regis filia, Mater gloriosissima mater orphanorum. Consolacio desolatorum via errantium salus in te sperantium. Virgo ante partum, uirgo in partu, virgo post partum. Fons misericordie fons salutis et gracie fons pietatis et leticie fons consolacione et indulgencie . . . Et hanc orationem supplicem suscipias et exaudias et vitam eternam michi tribuas. Audi et exaudi me dulcissima virgo maria mater dei et misericordie. Amen. (Printed: Leroquais, *Livres d'heures* 2:346–47 [no. xxxviii]. Common: *ibid.*, 1:xxiv, 15, etc. Contrast no. 19 below.)

4. Fols. 201v–204r. [No rubric.] O intemerata et in eternum benedicta singularis atque incomparabilis virgo dei genitrix maria gratissimum dei templum Spiritus sancti sacrarium. Ianua regni celorum per quam post deum totus vivit orbis terrarum. De te enim dei filius verus et omnipotens deus suam sanctissimam fecit matrem. Assumens de te illam sacratissimam carnem . . . Et talem penitenciam in hac vita pro cunctis sceleribus et peccatis meis agere, que ei precibus et meritis tuis bene placens sit et grata. Ita ut parcat michi in alia vita. Concedens michi misericorditer cum sanctis et electis suis vitam et requiem sempiternam. Amen. (Printed:

139. Susanne Kubersky-Piredda, "The Market for Painters' Materials in Renaissance Florence," in *Trade in Artists' Materials*, ed. Kirby et al., 223–43, esp. 224–25; also Nash, "Burgundian Court," 125–33.

140. Richard Gameson, Andrew Beeby, and Catherine Nicholson, with the assistance of Louise Garner, "Late Medieval English Illuminators' Blues" (forthcoming).

Leroquais, *Livres d'heures* 2:336–37 [no. xxi]. Common: *ibid.*, 1:xxv, 16, etc.; Wilmart, *Auteurs spirituels*, 494, 497.)

5. Fols. 204v–208v. [No rubric.] Sancta Maria dei genitrix mitissima domina per amorem unigeniti filii tui domini nostri iesu christi cum omnibus sanctis et electis dei veni in adiutorium michi et dignare intercedere pro me peccatore. Anima mea in angustiis posita est et spiritus meus estuans clamat ad te, Exaudi me piissima domina, Te benedicunt omnes generationes quia fecit tibi dominus magna qui potens est et sanctum nomen eius. Tu gloriosa dei genitrix, te deprecor beatissima semper virgo maria. Per sanctam natiuitatem tuam in qua creatorem omnium prolem genuisti, ut sis michi miserrimo peccatori in adiutorem in die exitus mei cum omnibus sanctis dei . . . Ideo depreco te beatissima et gloriosissima virgo maria per unigenitum filium tuum ut non derelinquas me sine adiutorio tuo sed adiuua me in omnibus angustiis et necessitatibus meis. O sanctissima, o dulcissima, o piissima, o misericordissima, o carissima, o pulcherrima, o filia dei, o sponsa christi, o scala celi, o mater dei, o virgo maria Tibi commendo corpus meum et animam meam et sensus meos ut me famulum tuum ab omnibus malis preteritis presentibus et futuris me custodias. Amen. (Leroquais, *Livres d'heures* 1:48, 230, and 318 only. Henri Barré, *Prières anciennes de l'Occident à la Mère du Sauveur. Des origines à saint Anselme* [Paris: Lethielleux, 1963], 116n84.)

6. Fols. 209r–210v. [No rubric.] O intemerata et in eternum benedicta singularis et incomparabilis virgo dei genitrix maria, gratissimum dei templum spiritus sancti sacrarium sola ianua regni celorum, Per quam post deum totus vivit orb[is] terrarum, inclina aures tue pietatis indignis supplicationibus meis et esto michi pia et in omnibus auxiliatrix . . . Et post huius vite cursum ad gaudia nos perducatur electorum electorum [sic] suorum. Benignissimus paraclitus gratiarum largitor optimus, Qui cum patre [etc.] (Common: Leroquais, *Livres d'heures* 1:xxv, 2, etc.; Wilmart, *Auteurs spirituels*, 488; Friedrich Stegmüller, *Repertorium Biblicum Medii Aevi* 8: *Supplementum* [Madrid: Consejo Superior de Investigaciones Científicas, 1976], no. 2227.6 [p. 404], noting an attribution to Edmund of Abingdon.)

7. Fols. 211r–213r. [No rubric.] O sanctissima gloriosissima et piissima dei genitrix virgo maria ego indignus et peccator tibi regine celesti committo esse posse nosse uiuere et valere velle meum sensus meos cor meum animam meam et corpus meum et quando michi aduenerit terminus vite mee quem preterire non possum, deo vocante commendo in tuam sanctam ac singularem custodiam et clemenciam . . . Exoro ut vindictam mei reatus secundum pietatem tuam et necessitatem meam tuearis domina clementissima. Amen. (Leroquais, *Livres d'heures* 1:318 and 2:278 only.)

8. Fols. 213v–215r. [No rubric.] Obsecro te beatissima mater incorrupta inviolata intemerata et intacta virgo dei

genitrix maria quia per tuam sanctam virginitatem meruisti regem angelorum portare intercede pro me peccatore ad dominum iesum christum filium tuum. Ego enim famulus tuus qui sub tua protectione confugio, vbi infirmi acceperunt consolacionem et virtutem in tribulacionem et omnes qui in te confidunt adiutorium accipiunt. Propter hoc rogo te et supplico mater domini nostri iesu christi ut per tuum meritum et per tuam sanctam intercessionem iesus christus filius tuus dominus deus meus dignetur exaudire orationem meam. Et presta michi domina ut dignus efficiar ad tuam consolationem pervenire in hora quoque exitus mei et in hora tremenda sis michi fortis defensor contra dyabolicas insidias et quando anima mea assumpta fuerit de corpore meo accipere eam digneris cum sanctis angelis tuis et libera eam de potestate inimici ut non liceat mihi transire portas inferni et vias tenebrarum . . . in omnibus fidelibus vivis et defunctis [sic] indulgenciam et requiem sempiternam concedat. Amen. (Not in Leroquais, *Livres d'heures*, but cf. 1:xxiv.)

9. Fols. 215v–217r. [No rubric.] O beatissima uirgo dei genitrix Maria que gratuita pietate semper refoues et consolaris omnes ad te confugientes. Juuamen pietatis . . . atque in hora tremendi iudicii omnium peccatorum vinculis absolutus esse merear te impetrante agminibus supernis filio tuo clementissimo complacentibus feliciter misericorditer que sociari adiuvante eodem domino nostro iesu christo filio tuo qui cum deo [etc.]. (Not in Leroquais, *Livres d'heures*.)

10. Fols. 217v–219r. [No rubric.] Ecce ad te confugio. Virgo nostra saluacio, spes salutis et venie Mater misericordie. Serva ad te fugientem salua in te confidentem Super omnes te exoro inter omnes te imploro. Tu es enim potencior super omnes et dulcior. Nullus enim confundetur sicut credo nec perdetur. Qui se tibi commendabit, qui te pure inuocabit O maria mater dei, Miserere precor mei. . . . O preclara stella maris que cum deo gloriaris, me ad portu fac venire, nunquam sinas me perire. O maria mater vite iudicium nimis triste, dona mihi euitare te que digne collaudare. O maria flos virginum ora pro me ad dominum ut ad celi palatia perueniam te premia. Amen. (Leroquais, *Livres d'heures* 1:35 and 46, and 2:94 only. Ulysse Chevalier, *Repertorium hymnologicum*, 6 vols. Subsidia hagiographica 4 [Louvain: Lefever, 1892–1921], 1: no. 5087.)

11. Fols. 219v–220v. *Oracio de nostra domina valde deuota.* Stabat mater Dolorosa, iuxta crucem lacrimosa, dum pendebat filius cuius animam gementem contristantem et dolentem pertransiuit gladius . . . Virgo virginum preclara, Iam mihi non sis amara fac me tecum plangere, fac ut portem christi mortem passionis eius sortem et plagas recolere. Fac me plagis vulnerari cruce ac inebriari ob amorem filii. Inflammatum et accensus per te virgo sim defensum in die iudicii. Fac me cruce custodiri morte christi premuniri confoueri gratia, quando corpus morietur fac ut anime donetur paradisi gloriam. Amen.

(Common: Leroquais, *Livres d'heures* 1:124 etc. Chevalier, *Repertorium hymnologicum*, 2: no. 19416; *Analecta hymnica*, ed. Dreves, Blume, et al., 54: no. 201, pp. 312–13.)

12. Fols. 221r–222r. *Deinde alia oratio de nostra domina*. Sancta et imperpetua uirgo maria gloriosa domina et aduocata mea. Confiteor dominum iesum christum tuum dulcissimum filium verum esse deum et verum hominem ex te natum in fine seculorum pro nostra salute et enim te pro me incessanter interueniente. Ipsi et tibi et omnibus sanctis confiteor omnia peccata meam quecumque feci a mea iuuentute usque in hanc horam vel alii per me et propter me pro quorum remissione et pro adiutorio omnium necessitatum meorum et illorum et omnium parentum affinium et benefactorum meorum et amicorum meorum et pro omnibus christianis uiuis et defunctis ad uitam eternam predestinatis in omni sexu etate et ordine offero tibi O mater misericordie hec quinque verba gaudii vite cumque [?For: vice quinque] plagarum quas ipse verus deus et verus homo suscepit in suo sanctissimo corpore pro nostra salute. Gaude gloriosa dei genitrix virgo semper maria. Gaude que gaudium ab angelo suscepisti. Gaude que genuisti et in luminis claritatem. Gaude mater misericordie et indulgentie. Gaude sancta dei genitrix virgo. Tu sola mater innupta. Te laudat omnis creatura genitricem lucis. Sis pro nobis quesumus perpetua interuentrix. Mater gracie mater misericordie tu nos ab hoste protege et in hora mortis suscipe. Amen. (A variant of Leroquais, *Livres d'heures* 1:47 and 2:92. Gilles Gérard Meersseman, *Der Hymnos Akathistos im Abendland II: Gruss-Psalter, Gruss-Orationen, Gaude-Andachten und Litanien* [Freiburg: Universitätsverlag Freiburg, 1960], 192–93 (no. 3). The antiphons it incorporates are René-Jean Hesbert, *Corpus antiphonalium officii*, 6 vols., *Rerum ecclesiasticarum documenta*, Fontes IX [Rome: Herder, 1963–79], no. 2920.)

13. Fols. 222v–223r. [No rubric.] Ave Maria gratia plena dei genitrix qui es sole et luna pulchrior. Ave gloriosa et nimis graciosa. Ave cui rex celi et terre concupiuit. Ave salutata ab angelo. Ave obumbrata a spiritu sancto. Ave pregnans de deo. Ave de tuis sacris visceribus meruisti filium dei generare . . . Ave domina angelorum atque archangelorum. Ave exultatio iustorum, Ave reparatio perditorum, Ave salus nostra, Ave omnium bonorum nostrorum virtus. Ave per misericordiam domini nostri saluatricem. Ave perhennis virgo maria angelorum et hominum laude dignissima et nimis veneranda per infinita secula seculorum. Amen. (Not in Leroquais, *Livres d'heures*.)

14. Fols. 223v–224r. *Sequitur deuota deprecacio ad Mariam uirginem*. Obsecro te Maria mater summe benignitatis per illam inestimabilem leticiam qua exultauit spiritus tuus in illa hora quando nunciatus est tibi conceptus filii tui. Et per illum diuinum misterium quod tunc operatus est spiritus

sanctus superueniens in te et uirtus altissimi obumbrans tibi. Et per illud plenum gaudium quo letificata est anima tua quando eleuata est super omnem multitudinem sanctorum celis, Ut mihi famulo tuo impetres a dilecto filio tuo gratiam spiritus sancti qui bene disponat per omnia mentem meam actus meos sermones meos omnemque vitam meam usque in finem. Et in nouissimis diebus meis ostendas michi beatam faciem tuam et annuncies mihi diem et horam obitus mei. Exaudi exaudi exaudi me mater misericordie et pietatis Amen. (Not in Leroquais, *Livres d'heures*; see Victor-Martial Leroquais, *Les Psautiers manuscrits latins des bibliothèques publiques de France*, 3 vols. [Macon: Protat Frères, 1940–41], 1:210 and 2:253; and Barré, *Prières anciennes*, 194n5.)

15. Fols. 224v–225r. [No rubric.] O gloriosissima mater et misericordissima uirgo maria, obsecro te per illam maximam compassionem et acerbissimum cordis dolorem quam habuisti quando dominum nostrum iesum christum verum deum et verum hominem ex te natum pro nostra redemptione et salute ante crucem nudatum et ipsum eleuatum et extensum crucifixum vulneratum pendentem . . . Ita te deprecor beatissima virgo maria ut habeas maxime compassionem et pietatem de me in omnibus tribulationibus temptationibus et necessitatibus meis anime et corporis et maxime domina mittissima miseremini ac pauperemini precor anime mee in hora mortis mee et in die iudicii. Amen. (Not in Leroquais, *Livres d'heures*.)

16. Fols. 225v–226r. *Deuota oratio salutifera de nostra domina*. Ave Maria Gracia plena dominus tecum benedicta tu in mulieribus et benedictus fructus ventris tui, Iesus. Ave, Per ipsum fructum ventris tui o purissima domina conserua animas nostras et corpora nec nos deseras in hoc seculo neque in futuro sed in presenti vita conserva et conforta ut deo soli placere valeamus. Et in hora exitus nostri per dulcissimam consolationem et piam iustificationem atque misericordissimam erepcionem tuam ab omni demonica potentate liberari sentire mereamur. Et post obitum nostrum dignare nos presentare carissimo atque dulcissimo filio tuo. In fide tua digneris suscipere pro nobis misericorditer intercedere digneris ne nostris meritis iudicemur sed per te a domino deo nostro saluemur. Atque illa miseracione qua diligentibus te misereris nostri miseraris, ut possimus et ipsi tecum letari quod meritis et intercessionibus tuis nobis donec iesus christus filius tuus dominus, qui cum patre [etc.] amen. (Not in Leroquais, *Livres d'heures*; but cf., e.g., London, British Library, MS Egerton 2781, fols. 24r–25r.)

17. Fols. 226v–227r. *Sequitur oratio de nostra domina*. O gloriosa dei genitrix uirgo semper maria piissima domina mea, unica spes mea sola dulcedo mea sancta consolatio mea. Tota post deum refugium meum in tua caritate maximam fiduciam habeo quia nullus ita miseriis meis valeat succurrere sicut tu . . . ut per te purificatus a sordibus

peccatorum ad gratiam dulcissimi filii tui peruenire valeam. Amen. (Not in Leroquais, *Livres d'heures*. Nor is this Chevalier, *Repertorium hymnologicum*, no. 13037.)

18. Fols. 227v–228r. [No rubric.] Sancte Maria mater domini nostri iesu Christi, in manus eiusdem filii tui et in tuas et in manus omnium sanctorum et sanctarum commendo hodie et in omni tempore animam meam et corpus meum cogitationes et locuciones meas opera mea visum meum intellectum meum labia mea et pedes meos aures et manus manus [sic] meas et totum corpus meum. Custodi me te deprecor a nociva fragilitate carnis a viciis a criminibus. . . . Et fac me tuis semper obedire mandatis et a te nunquam in perpetuum separari permittas. Amen. (Leroquais, *Livres d'heures*, 1:356 only.)

19. Fols. 228v–229r. [No rubric.] Deprecor te domina sancta maria mater dei pietate plenissima summi regis filia mater misericordie mater orphanorum consolatio desolatorum via errantium salus in te sperantium, virgo ante partum, virgo in partu, virgo post partum, fons misericordie, fons pietatis et leticie, fons consolacionis et indulgencie, ut intercedas pro me miserrimo peccatore famulo tuo parentibusque meis . . . Et post mortem cum sanctis et electis tuis vitam eternam, et omnibus vivis et defunctis vitam et requiem sempiternam. (Leroquais, *Livres d'heures*, 1:34, 40, and 51; 2:262. Contrast no. 3 above.)

20. Fols. 229v–230r. *Alia oratio deuotissima de maria*. O domina misericordissima dei genitrix maria, dignare meis indignissimis precibus annuere quas effundere presumo coram dulcissimo filio tuo domino nostro iesu christo et coram te pro omnibus christianis vivis et defunctis in omni sexu etate et ordine et pro animabus patris et matris mee et omnium parentum meorum et affinium . . . Vivis omnibus dare dignetur spacium penitendi et studium ac voluntatem omnia mala preterita emendandi vbi nunquam ulterius repetendi et in bonis operibus usque in finem perseverandi, et defunctis [sic] omnibus fidelibus remissionem peccatorum et vitam eternam cum sanctis et electis suis. Qui vivit etc. (Not in Leroquais, *Livres d'heures*.)

21. Fols. 230v–231r. *Deuota salutatio de nostra domina*. Saluto te sancta maria Regina celorum domina angelorum ea salutacione qua salutavit te archangelus gabriel dicens, Ave gratia plena. . . . Et adoro te per illam leticiam quam habuisti in illa nocte qua peperisti filium tuum sine dolore quem concepisti sine virili semine, ut letifices me in hora defunctionis mee et subuenias mihi in omnibus necessitatibus et angustiis meis. Obsecro te sancta maria et te sante johannes euangelista per dolorem quam habuistis in domini morte ut subveniatis michi in illa dicta hora et in omnibus necessitatibus meis ac fragilitatibus corporis mei et anime mee. Precor vos etiam per illud gaudium quo habuistis in domini resurrectionem ut sitis michi in adiutorium in hac

presenti vita, et cor meum letificare dignemini. Cum domino nostro iesu christo qui vivit etc. (Seemingly an expanded version of Leroquais, *Livres d'heures*, 2:61 and 271.)

22. Fols. 231v–234v. *Autre Oroison de nostre dame en Francois*. Tres douce uierge pucelle marie mere de iesu crist, le vray dieu tout puissant, royne glorieuse qui estes refuge consolacion et confort de tous les deconfortez. Aide et deffence aux pources pecherus contre toutes temptacions et les gardes de tous perilz et de toutes tribulacions par vostre tres grant doulceur et debonairete vueillies mon ame et mon corps conforter visiter et enseigner et adrescier contre les tribulacions et temptacions de ceste doloieuse vie qui forment me grievent en moult de manieres les quelles par moy ie ne puis escheuer sans votre ayde . . . Pourquoi ie vous requier que par vous doulces prieres et intercessions, je puisse venir a la grant joye de paradis. Amen. (Not in Leroquais, *Livres d'heures*. Cf. Jean Sonet, *Répertoire d'incipit de prières en ancien français*, Société de publications romanes et françaises 54 [Geneva: Droz, 1956], no. 563.)

23. Fols. 235r–236v. *Oroison de nostre dame en Francois*. O tres certaine esperance dame et deffenderesse de tous ceulx qui si attendent Glorieuse vierge marie en ycelle heure que mes yeux seront si agrevez de la tres noire obscurte de la mort, que ie ne pourray veoir la clarte de ce siecle [et] que ie ne pourray mouuoir ma lange . . . Mais par toy douce dame soit mon ame de toutes pars garde et presentee a ton filz et en possession mis durable repos et en la joye du royaume qui jamais ne fauldra amen. (Common. A version printed in Leroquais, *Livres d'heures*, 2:332 [no. XVI]; Sonet, *Répertoire*, no. 1538.)

24. Fols. 237r–241r. *Les xv joyes nostre dame*. D[o]ulce dame de misericorde mere de pitie fontaine de tous biens qui portastes Nostre seigneur iesu crist neuf mois en voz precieux flans et lalaitastes de vos doulces mamelles . . . douce dame priez lui pour moy et pour tous pecheurs et pecheresses dont il veult estre -?- que il ait mercy de nous. Amen. Ave maria gratia plena. (A version printed in Leroquais, *Livres d'heures*, 2:310–11 [no. V]. Common: *ibid.*, 1:30, etc. Sonet, *Répertoire*, no. 458.)

25. Fols. 241v–246r. [No rubric.] O Royne qui fustes mise et assise lasus en throne divin en vostre deuote eglise | Sans faintise | Suis Venu a ce matin | comme vre pelerin | chef enclin | humblement je vous presente | m'ame et mon corps afin | qu'a ma fin | vous vueillies estre presente | Vierge royne debonaire | exemplaire | de parfaite charite | vers vous ie me vueil retraire | et sousztraire | vueil mon cuer de vanite | . . . | Vers vous me suis transporte | pour estre reconforte | supporte | par vous ce iour espouventable | sil vous plaist et deporter | et porte | en la gloire pardurable Amen. (Leroquais, *Livres d'heures*, 2:113 only. Sonet, *Répertoire*, no. 1804.)

26. Fols. 247r–253r. *Oroison et complainte a nostre dame*. Je vien et ie vous presente | Marie vierge excellente | ma complainte en vo chapelle | de lyesse ou jay entente | Si tost que ie me demente | ta voix joyeuse nouuelle | mere de dieu vraye ancelle | . . . | L'autre amour n'est qu'amour painte | Mais la vraie est si tres forte | que jamais ne desconforte | seruant qui vous serue en crainte. (Not in Leroquais, *Livres d'heures*. Sonet, *Répertoire*, no. 917.)

27. Fols. 303r–305r. *De nostra domina*. Stella maria maris | que sola beata uocaris | Virgo regalis | et amica dei spiritualis | Janua virtutis | nostre tutela salutis | Porta patens celi | Succurras prompta fideli | Ad te supplico | tua dona beata requiro | Tu spes lapsorum | Tu refugium miserorum | tu foris ortorum | Tu sanctificatio nostrorum | Tu me saluifica | Christi specialis amica | . . . | Sis ope diuina | Medicus simul et medicina | Meque reconcilia | sanctissima uirgo maria | Ut benedicatur | largitor tui famulatur | Ponthus terra polus | regnans super omnia solus | amen. (Not in Leroquais, *Livres d'heures*. Printed: James et al., *Descriptive Catalogue*, Appendix 2:368–70.)

28. Fols. 305v–306v. *Septem gaudia beate marie virginis*. Gaude flore virginali honoreque spirituali [*sic* for 'speciali'], transcendens splendiferum angelorum principatum et sanctorum decoratum dignitate numerum . . . et secunda quod hec tua gaudia non cessabunt nec decrescent sed durabunt et florescent per eterna secula. Amen. (Common: Leroquais, *Livres d'heures*, 1:xxvii, 47, etc.; *Analecta hymnica* 31:198–99; attributed in some late medieval manuscripts to Thomas Becket.)

Appendix II: Experimental Details

Raman spectra were recorded using a spectrometer specifically developed for the study of pigments in manuscripts. The system employs a diode laser (633.0 nm, Ondax) attenuated using a neutral density filter and focused into a fiber-optic cable for delivery to a custom-built Raman probe equipped with an ultra-long working distance $\times 40$ microscope lens, which also collects the backscattered Raman signal and provides a working distance of ca. 10 mm from the surface of the book. The laser power at the sample was maintained at < 0.5 mW and has a minimum spot-size at sample of ca. 50 μm diameter. This yields a laser power density calculated at 20 W cm^{-2} . The Raman signal is collected and passed down a second fiber-optic cable to a spectrograph/cooled CCD camera (Ocean Optics QEPro). The spec-

trometer control software was used to correct for the spectral response of the system, and the wavenumber calibrated using a neon lamp. Spectra were typically the sum of 10×5 s acquisitions. For many samples that fluoresce (e.g., indigo), 5 s was the maximum integration time that could be used without saturating the sensor. For this reason, and to simplify data acquisition, 10 acquisitions were co-added to increase the signal to noise ratio for both fluorescent and non-fluorescent samples. The Raman sampling head was mounted on a vertical translation stage, itself mounted on a sliding rail fitted to a gantry that holds the head vertically over the open bound volume. Access to different regions of the object is achieved by sliding the head left and right along the gantry, or by moving the entire gantry backward and forward. Vertical adjustment of the sampling head allowed fine focus control of the sampling head to achieve optimum signal. A USB microscope was also mounted on the sampling head, allowing an image of the area and the precise position of the laser spot on the painting to be captured.

Visible and near infrared fiber-optic reflectance spectroscopy (FORS) was carried out using a bespoke near-infrared and visible FORS spectrometer, the probe attached to the gantry described above. This spectrometer employs two components: the filtered output of a tungsten-halogen lamp ($\lambda < 1400$ nm) was combined with the output of a Fourier transform interferometer and halogen lamp (Arcoptix). The combined outputs were directed into a bifurcated fiber optic cable and the output of the two fibers imaged onto the page under study at $\pm 45^\circ$ to the vertical. The scattered light from the page was collected perpendicular to the page, and the visible-NIR spectral component analyzed, by a fiber-coupled spectrograph/CCD (400–1050 nm, Ocean Optics Maya), while the NIR/SWIR component was recorded using a cooled InGaAs detector (800–2500 nm, Arcoptix). The two separate data sets were recombined to give the full spectrum. A diffuse white Spectralon® standard (Labsphere Inc.) was used to calibrate the instrument to apparent reflectance.

Multispectral images were recorded using a DSLR modified for UV-NIR sensitivity (Canon EOS-D50) and equipped with an apochromatic lens ($f=60$ mm, Jenoptik), held perpendicular to, and above, the open manuscript. Images were recorded through a series of interference filters (400–950 nm, 25 nm bandpass) with the sample area illuminated via a bank of LED lamps selected to match the filter wavelengths. Data were processed using MATLAB.

Pigment Identifications

Folio	2r	69v	101r	141r	151r	293r	294r
Depiction	Annunciation	Coronation BVM	Funerary Procession	Patron	Heaven and Zodiac	Mary Magdalen	Margaret
Red	Vermillion + Organic (initial & border), Minium (foliage)	Vermillion + Organic and Minium	Minium + Organic	Vermillion + Organic and Minium	Organic and Minium	Organic and Minium, Vermillion (border)	Vermillion + Organic and Minium
Orange	Mosaic Gold	Mosaic Gold		Vermillion shading		Mosaic Gold	
Yellow	Lead-Tin Yellow (Type I), Organic and Ochre	Lead-Tin Yellow (Type I) and Ochre	Organic	Lead-Tin Yellow (Type I) and Ochre	Lead-Tin Yellow (Type I)	Lead-Tin Yellow (Type I) and Ochre	Ochre
Green	Copper-based	Copper-based	Indigo + Lead-Tin Yellow mixture (Vergaut) and Copper-based	Copper-based	Indigo + Lead-Tin Yellow mixture (Vergaut) and Copper-based	Indigo + Lead-Tin Yellow mixture (Vergaut) and Copper-based	Copper-based (+ Indigo to darken)
Blue	Lapis and Indigo (plus Carbon to shade)	Lapis	Lapis and Indigo (+ White Lead to lighten)	Lapis and Indigo (+ White Lead to lighten)	Lapis and Indigo	Lapis	Lapis and Indigo
Purple/Pink	Organic (and Indigo to darken)		Organic		Organic	Organic	
White			White Lead				
Grey	Carbon			Carbon	Carbon	Carbon + Indigo	Carbon + Indigo
Black	Carbon	Carbon	Carbon	Carbon	Carbon	Carbon	Carbon
Brown				Ochre and Vermillion shading			Ochre
Gold	Gold	Gold	Gold	Gold	Gold	Gold	Gold